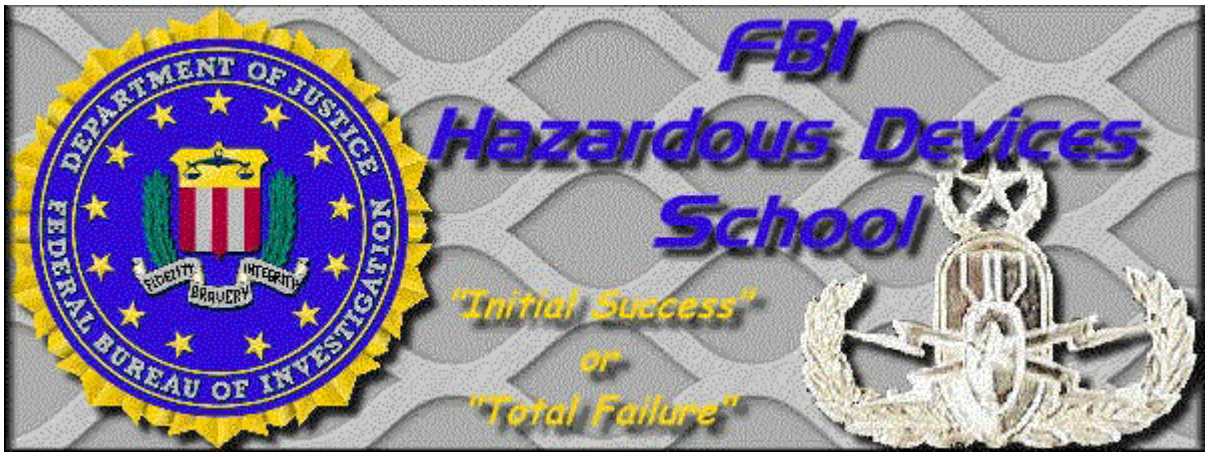
FINAL
ENVIRONMENTAL ASSESSMENT
FOR THE
DEVELOPMENT OF A
HAZARDOUS DEVICES TRAINING FACILITY
ON
REDSTONE ARSENAL, ALABAMA



U. S. ARMY AVIATION AND MISSILE COMMAND
REDSTONE ARSENAL, ALABAMA

OCTOBER 1998

October 6, 1998

**FINDING OF NO SIGNIFICANT IMPACT (FNSI)
FOR THE ENVIRONMENTAL ASSESSMENT FOR THE DEVELOPMENT
OF A HAZARDOUS DEVICES TRAINING FACILITY ON
REDSTONE ARSENAL, AL**

PROPOSED ACTION: The Federal Bureau of Investigation (FBI) proposes to develop a Hazardous Devices Training Facility (HDTF) on Redstone Arsenal (RSA), Alabama that would serve as headquarters and primary training grounds for the Hazardous Devices School (HDS).

BACKGROUND: Redstone Arsenal, located in Madison County, southwest and adjacent to the city of Huntsville, Alabama, occupies 37,910 acres of land and employs approximately 21,500 government and contractor personnel. Since 1981, RSA has been home to the Department of Justice, Federal Bureau of Investigation's (FBI) HDS.

The current HDS mission is to provide training to civilian law enforcement and public safety personnel in the design, construction, render safe, and disposal of hazardous explosive devices. Training is conducted for the FBI on a partially reimbursable basis. Civilian students include Police and Fire Department personnel, and others required by duty to engage in bomb disposal or other bomb squad procedures. The HDS at RSA is the only school in the United States where non-military public safety officials can be trained and certified as bomb disposal technicians.

PURPOSE OF AND NEED FOR THE PROPOSED ACTION: Current events in the United States and overseas have demonstrated a need for increased capabilities to combat terrorist activities. The FBI's planned expansion of the HDS program from four to five weeks will result in a more intensive training program and also increase the current class frequency, which would result in more certified bomb disposal technicians available to address these random acts of violence.

The existing facilities on RSA have limited capacity to provide for this increased training program and are proposed for expansion and the development of more realistic training facilities. The purpose of the Proposed Action is to construct a HDTF on RSA that would increase the training effectiveness and student capacity (up to 900 per year) of the current HDS and provide a more realistic training environment.

The Proposed Action would occur at two separate sites on RSA. One site, approximately 215 acres in size, located north of Buxton Road and bordered by Redstone Road, West Line Road, and East Line Road, would serve as headquarters and primary training grounds. The other proposed site, adjacent and north

of the existing Hazardous Devices Demolition (HDD) Range, is approximately 70 acres in size. No earth-moving activities are planned for this area. The Proposed Action would include the construction of a 29,000 square foot General Instruction Facility, a 15,500 square foot Operational Deployment Facility, a 9,000 square foot Instructor Support Facility, a Mock City/Training Area, eight disrupter firing pits, and necessary utility facilities (electrical, sewer, gas). All of the proposed construction activities would take place in the area north of Buxton Road and would include the addition of several paved roads, curbing, guttering, and landscaping.

ALTERNATIVES CONSIDERED: Alternatives to the Proposed Action considered were the No-Action Alternative and the Alternate Location Alternative. Under the No-Action Alternative HDS operations would continue without the benefits of expanded and modernized facilities. The HDS training activities would continue as scheduled but the training areas would be restricted to the current status. Class sizes and frequency would increase, as anticipated under the Proposed Action; however, resulting in class overcrowding, staffing difficulties, and class fragmentation as widely scattered buildings and facilities across RSA would have to be utilized to absorb the increased student load. These restrictions would probably limit the sustained student load to approximately 600 per year.

Another alternative considered was the Alternate Location Alternative. This alternative considered moving the HDS mission and operations to the Quantico U. S. Marine Corps Base in Quantico, Virginia. This is the location of the FBI Academy, where the majority of FBI agent training currently takes place. Quantico was the only alternative location considered in the initial planning phases for the Proposed Action. This alternative was not feasible because the 385 acre site currently occupied by the FBI Academy was not able to accommodate the additional requirements of the HDS. The HDS has operated for a period of 27 consecutive years at RSA. During this time, the HDS has established a reputation within the hazardous devices community which remains unsurpassed in the United States. As mentioned previously, the HDS is the only Certified Bomb Disposal Technician training school in America. Staff continuity is a vital aspect of the HDS program. Even if relocation to Quantico could provide adequate space and accommodations for the Proposed Action, staff continuity would be detrimentally impacted as new staff would need to be identified and trained resulting in potentially significant delays to full operational capability. Based on these considerations and other criteria addressed in the selection process, negative impacts from the relocation to Quantico were deemed significant enough to eliminate this alternative from further consideration.

ENVIRONMENTAL EFFECTS: Eleven broad environmental components were considered to provide a context for understanding the potential effects of the Proposed Action and a basis for assessing the significance of potential impacts. The areas of environmental consideration are air quality, biological resources, cultural resources, hazardous materials and waste, health and safety, infrastructure and transportation, land use, noise, geology and soils, socioeconomics, and water resources.

CONCLUSIONS: No significant impacts to any of the above listed resources examined in this EA are anticipated from implementing the Proposed Action or the No Action Alternative. A short-term positive impact to socioeconomics would be anticipated from construction activities and increased student enrollment expected from implementing the Proposed Action Alternative. Also, several sites potentially eligible for nomination for listing on the National Register of Historic Places (NRHP) were investigated. Potential significant impacts as a result of the Proposed Action to these Cultural Resources would be avoided by proper identification and coordination with the Alabama State Historic Preservation Office (ALSHPO) and the Installation Cultural Resources Manager.

Several other environmental components that were considered in this EA that have the potential for non-significant impacts include: Air Quality, Noise, Water, Soils, and Health and Safety. Potential impacts to these resources would be directly related to the construction activities required by the Proposed Action Alternative. These impacts would mitigated by the implementation of Best Management Practices by the construction contractors. Non-construction related Noise impacts would be mitigated by the adherence to HDS Standard Operating Procedures and the Installation Compatible Use Zone (ICUZ) Program.

Under the No-Action Alternative, RSA would not construct new facilities for the HDS. If this alternative is chosen the capabilities of the HDS to sustain an increased student enrollment would be adversely impacted due to class crowding and inadequate facilities. Additionally, the ability of the HDS to provide realistic, state-of-the-art training scenarios would remain limited without the construction of new facilities. The No-Action Alternative was not chosen primarily for these reasons.

We found no significant environmental impacts associated with this action that would require the publication of an Environmental Impact Statement.

DEPARTMENT OF THE ARMY
UNITED STATES ARMY AVIATION AND MISSILE COMMAND
REDSTONE ARSENAL, ALABAMA

FINDING OF NO SIGNIFICANT IMPACT FOR THE DEVELOPMENT OF A HAZARDOUS DEVICES TRAINING FACILITY ON REDSTONE ARSENAL, ALABAMA

PREPARED OCTOBER 1998

PROPONENT OF THE ACTION:

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EXECUTIVE SUMMARY

INTRODUCTION

Recent bombings in Oklahoma City, Atlanta, and Birmingham, are testament that random acts of domestic terrorism are on the rise. In addition, recent events in the Middle East have heightened concern for the possibility of international terrorist use of Weapons of Mass Destruction (WMD) in the United States. Public awareness of the potential for terrorist use of chemical, biological, and nuclear materials has escalated. Bombers are often indiscriminate and frequently evade law enforcement by the remote nature of their crimes, the improvised explosive mixtures, and the use of sophisticated fuzing systems. Enforcing the law is challenging enough without the additional risk of improvised explosive devices. It is for these reasons that the resources of the Army and FBI come together at the HDS in an effort to combat terrorist acts.

DESCRIPTION OF THE PROPOSED ACTION

The Hazardous Devices School (HDS) at Redstone Arsenal (RSA), Alabama, has been operating from the same facilities since 1971, when the first three-week basic hazardous devices training class was held. The FBI assumed responsibility for training in 1981, and in 1983 the basic course was extended to four weeks. Current events in the United States and overseas have demonstrated a need for increased capabilities to combat terrorist activities. The proposed expansion of the HDS program to five weeks would result in a more intensive training program and also increase the current class frequency, which would result in more certified bomb disposal technicians available to address these random acts of violence. The existing facilities on RSA have limited capacity to provide for this increased training program and are proposed for expansion and development of more realistic training facilities.

The purpose of the Proposed Action is to increase the effectiveness and capacity (up to 900 students per year) of the current HDS mission by providing a more realistic training environment and extend the technical capabilities of the school. The proposed Hazardous Devices Training Facility (HDTF) on RSA would serve as headquarters and primary training grounds for the HDS. The Proposed Action, evaluated in this Environmental Assessment (EA), would expand the capabilities of hazardous devices training operations at the HDS through the construction and implementation of the HDTF.

Two sites would be developed during the implementation of the Proposed Action. One site, approximately 215 acres in size, located north of Buxton Road and bordered by Redstone Road, West Line Road, and East Line Road, would serve as headquarters and primary training grounds of the HDS. The other proposed site, adjacent and north of the existing Hazardous Devices Division (HDD) Range, is approximately 70 acres in size. This area is to be used for training utilizing realistic mock-ups of training scenarios located in various areas around the HDTF. No earth-moving activities would be carried out in this area. The Proposed Action would include the construction of a 29,000 square foot General Instruction Facility, a 15,500 square foot Operational Deployment Facility, a 9,000 square foot Instructor Support Facility, a Mock City/Training Area, eight disrupter

firing pits, and necessary utility facilities (electrical, water, communication, sewer, gas). The proposed construction activities would take place in the area north of Buxton Road and would include the addition of several paved roads, curbing, guttering, and landscaping.

ALTERNATIVES CONSIDERED

Alternatives to the Proposed Action considered were the No-Action Alternative and the Alternate Location Alternative. Under the No-Action Alternative HDS operations would continue without the benefits of expanded and development of more realistic training facilities. The HDS training activities would continue as scheduled but the training areas would be restricted to the current status. Class sizes and frequency would increase, as anticipated under the Proposed Action; however, resulting in class overcrowding, staffing difficulties, and class fragmentation as widely scattered buildings and facilities across RSA would have to be utilized to absorb the increased student load. These restrictions would probably limit the sustained student load to approximately 600 per year.

Another alternative considered was the Alternate Location Alternative. This alternative considered moving the HDS mission and operations to the Quantico U.S. Marine Base in Quantico, Virginia. This is the location of the FBI Academy, where the majority of FBI agent training currently takes place. Quantico was the only alternative location considered in the initial planning phases for the Proposed Action. This alternative was not feasible because the 385 acre site currently occupied by the FBI Academy was not able to accommodate the additional requirements of the HDS. The HDS has operated for a period of 27 consecutive years at RSA. During this time, the HDS has established a reputation within the hazardous devices community which remains unsurpassed in the United States. As mentioned previously, the HDS is the only Certified Bomb Disposal Technician training school in America. Staff continuity is a vital aspect of the HDS program. Even if relocation to Quantico could provide adequate space and accommodations for the Proposed Action, staff continuity would be detrimentally impacted as new staff would need to be identified and trained resulting in potentially significant delays to full operational capability. Based on these considerations and other criteria addressed in the selection process, negative impacts from the relocation to Quantico were deemed significant enough to eliminate this alternative from further consideration.

METHODOLOGY

This EA analyzes the potential environmental consequences of the Proposed Action in compliance with the National Environmental Policy Act (NEPA); Department of Defense Directive 6050.1, *Environmental Effects in the United States of Department of Defense Actions*; and Army Regulation 200-2, *Environmental Effects of Army Actions*.

Eleven environmental components were considered as a basis for assessing the significance of potential impacts. These areas are air quality, biological resources, cultural resources, hazardous materials and waste, health and safety, infrastructure and transportation, land use, noise, geology and soils, socioeconomics, and water resources.

CONCLUSIONS

No significant impacts to any of the above listed resources examined in this Environmental Assessment (EA) are anticipated from implementing the Proposed Action or the No Action Alternative. A short-term positive impact to socioeconomics would be anticipated from construction activities and increased student enrollment and staffing expected from implementing the Proposed Action Alternative. Also, several sites potentially eligible for nomination for listing on the National Register of Historic Places (NRHP) were investigated. Potential significant impacts as a result of the Proposed Action to these Cultural Resources would be avoided by proper identification and coordination with the Alabama State Historic Preservation Office (ALSHPO) and the Installation Cultural Resources Manager.

Several other environmental components that were considered in this EA that have the potential for non-significant impacts include: Air Quality, Noise, Water, Soils, and Health and Safety. Potential impacts to these resources would be directly related to the construction activities required by the Proposed Action. These impacts would be mitigated by the implementation of Best Management Practices by the construction contractors. Non-construction related Noise impacts would be mitigated by the adherence to HDS Standard Operating Procedures and the Installation Compatible Use Zone (ICUZ) program.

Under the No-Action Alternative, RSA would not construct new facilities for the HDS. If this alternative is chosen the capabilities of the HDS to sustain an increased student enrollment would be adversely impacted due to class crowding and inadequate facilities. Additionally, the ability of the HDS to provide realistic, state-of-the-art training scenarios would remain limited without the construction of new facilities. The No-Action Alternative was not chosen primarily for these reasons.

LIST OF ACRONYMS AND ABBREVIATIONS

AAC	Alexander Archaeological Consultants
ACHP	Advisory Council on Historic Preservation
ACM	Asbestos-Containing Material
ADEM	Alabama Department of Environmental Management
ALNHP	Alabama Natural Heritage Program
ALSHPO	Alabama State Historic Preservation Office
AMCOM	U.S. Army Aviation and Missile Command
AR	Army Regulation
BDC	Bomb Data Center
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWS	Chemical Warfare Service
dB	Decibels
dBA	A-weighted Decibels
DEMP	Directorate of Environmental Management and Planning
DoD	Department of Defense
DOT	Department of Transportation
DRMO	Defense Reutilization Marketing Office
EA	Environmental Assessment
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
FBI	Federal Bureau of Investigation
GCWD	Gulf Chemical Warfare Depot
HAP	Hazardous Air Pollutant
HDD	Hazardous Devices Demolition
HDS	Hazardous Devices School
HDTF	Hazardous Devices Training Facility
HSB	Huntsville Spring Branch
ICUZ	Installation Compatible Use Zone
LBP	Lead-Based Paint
MICOM	U.S. Army Missile Command
MOA	Memorandum of Agreement
MSDS	Material Safety Data Sheet
MSFC	Marshall Space Flight Center
msl	Mean Sea Level
MWB	Mineral Water Bottle
NADB	National Archaeological Database
NAGPRA	Native American Graves Protection and Repatriation Act
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act

NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OMMCS	Ordnance Missile and Munitions Center and School
OSHA	Occupational Safety and Health Administration
PDD	Presidential Decision Directive
RCRA	Resource Conservation and Recovery Act
REC	Record of Environmental Consideration
ROI	Region of Influence
RSA	Redstone Arsenal
RTTC	Redstone Technical Test Center
SARA	Superfund Amendments and Reauthorization Act
SHPO	State Historic Preservation Office
SOP	Standard Operating Procedure
TRADOC	Training and Doctrine Command
TVA	Tennessee Valley Authority
U.S.	United States
USACOE	U.S. Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USSR	Union of Soviet Socialist Republics
WMD	Weapons of Mass Destruction
WNWR	Wheeler National Wildlife Refuge

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APPENDICES

1.0 NEED FOR AND PURPOSE OF PROPOSED ACTION

The National Environmental Policy Act (NEPA); the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508); Department of Defense (DoD) Directive 6050.1, *Environmental Effects in the United States of Department of Defense Actions*; and Army Regulation (AR) 200-2, *Environmental Effects of Army Actions*, which implement these laws and regulations, direct DoD and Army officials to consider environmental consequences when authorizing or approving Federal actions. This Environmental Assessment (EA) analyzes the environmental consequences associated with expansion and further development of the Hazardous Devices Training Facility (HDTF) on Redstone Arsenal (RSA), Alabama, which would serve as headquarters and primary training grounds for the Hazardous Devices School (HDS). The HDS is currently located at RSA, under the joint direction of the Army and the Department of Justice, Federal Bureau of Investigation (FBI).

Section 1.0 of this document discusses the background and briefly describes the Proposed Action, introduces the purpose of and need for the action, notes the location(s) of the project, and highlights issues raised during the assessment process. Section 2.0 discusses project alternatives, including the Proposed Action. Section 3.0 describes the affected environment at the location(s) of the Proposed Action. Section 4.0 assesses the potential environmental consequences of implementing the Proposed Action and alternatives and highlights impacts and mitigation measures for each resource. Section 5.0 presents the conclusions of the assessment and a recap of the mitigation measures for selected resources. Section 6.0 lists preparers for this EA. Section 7.0 lists individuals and agencies consulted and the agencies, organizations, and individuals sent copies of the EA. Section 8.0 lists references used to prepare this document.

References for this document are presented in three ways. References presented after a period refer to the preceding paragraph. References presented before a period refer only to the information in that sentence. References presented within a sentence refer specifically to the fact they follow.

1.1 BACKGROUND

Redstone Arsenal (RSA) is located in Madison County, southwest and adjacent to the city of Huntsville, Alabama (Figure 1-1). RSA currently comprises 37,910 acres (including special-use permit land) located on an approximately six mile wide by ten mile long site (U.S. Army Missile Command, 1995). Approximately 21,500 government and contractor personnel are employed at RSA. Prior to acquisition by the Army, the land comprising the present day Arsenal was primarily used for producing cotton, corn, hay, small grain crops, and livestock.

The U.S. Army Ordnance Missile and Munitions Center and School (OMMCS) is an ordnance branch service school of the Training and Doctrine Command (TRADOC) and a tenant of the U.S. Army Aviation and Missile Command (AMCOM) located on the Arsenal. The HDS is funded and administered by the FBI; OMMCS operates the HDS on a reimbursable basis.

Figure 1-1

The current HDS mission is to provide training to civilian law enforcement and public safety personnel in the design, construction, render safe, and disposal of hazardous explosive devices. Training is conducted for the Department of Justice, FBI on a partially reimbursable basis. Civilian students include Police and Fire Department personnel, and others required by duty to engage in bomb disposal or other bomb squad procedures. The HDS at RSA is the only school in the United States where non-military public safety officials can be trained and certified as bomb disposal technicians. It is funded and administered by the Department of Justice, FBI, through the Explosives Unit-Bomb Data Center (BDC), which also oversees the technical training of all public safety bomb disposal personnel throughout the U.S. at the HDS.

The HDS has been in operation at RSA since 1971 and is considered one of the best explosive devices schools in the world. Graduates of HDS will be found in nearly every bomb squad in the US and in many foreign countries. Under joint direction of the OMMCS and the FBI, the HDS trains over 400 students per year and has graduated more than 5,600 civilian bomb technicians from the basic four week course, 4,500 of which have returned for the one week refresher course. In the past, recertification was recommended every three years, however, this requirement is now mandatory.

Existing facilities associated with HDS include Buildings 3445, 3446, and 3450, located in the U.S. Army OMMCS Headquarters area in the northeastern portion of RSA. These buildings are currently utilized for classrooms, office space, storage, workshops, and laboratories. These buildings will be returned to the Army for use when vacated by the HDS.

Existing range facilities associated with the HDS include an approximately 63 acre restricted training site located approximately 1.5 miles east of Patton Road and south of Buxton Road, near the southeastern boundary of RSA. This site, known as the Hazardous Devices Division (HDD) Range, is used as a civilian law enforcement training area. Several buildings are located on this site including Building 8976, used for classrooms and office space; Building T-8989, a temporary building used for storage; and seven small metal buildings and a mobile home used as a training lab. Currently this area contains one approximately 250′ x 30′ sand pit used for explosives demolition training. (U.S. Army Aviation and Missile Command, 1997)

1.1.1 Description of the Proposed Action. The Proposed Action is to develop a HDTF on RSA, which would serve as headquarters and primary training grounds for the HDS, currently located at RSA. This action, evaluated in this EA, would extend the capabilities of hazardous devices training operations at the HDS through the construction and implementation of the HDTF.

The Proposed Action would occur at two separate sites. One site, approximately 215 acres in size, located north of Buxton Road and bordered by Redstone Road, West Line Road, and East Line Road, would serve as headquarters and primary training grounds. The other proposed site, adjacent and north of the existing HDD Range, is approximately 70 acres in size. This site would be used for field training using realistic mock-up training scenarios located in various locations. No earth-moving activities would take place on this site. The Proposed Action would include the construction of a 29,000 square foot General Instruction Facility, a 15,500 square foot Operational

Deployment Facility, a 9,000 square foot Instructor Support Facility, a Mock City/Training Area, eight disrupter firing pits, and necessary utility facilities (electrical, sewer, gas). The proposed construction would take place on the site north of Buxton Road and would include the addition of several paved roads, curbing, guttering, and landscaping. A more detailed description of the Proposed Action is contained in Section 2.2.1.

1.1.2 Need for the Action. Recent bombings in Oklahoma City, Atlanta, and Birmingham, are testament that random acts of domestic terrorism are on the rise. In addition, recent events in the Middle East have heightened concern for the possibility of international terrorist use of Weapons of Mass Destruction (WMD) in the United States. Public awareness of the potential for terrorist use of chemical, biological, and nuclear materials has escalated. Bombers are often indiscriminate and frequently evade law enforcement by the remote nature of their crimes, the improvised explosive mixtures, and the use of sophisticated fuzing systems. Enforcing the law is challenging enough without the additional risk of improvised explosive devices. It is for these reasons that the resources of the Army and FBI come together at the HDS in an effort to combat terrorist acts.

On June 21, 1995, President Clinton signed Presidential Decision Directive (PDD) 39, which set forth a number of initiatives for the U.S. to "reduce its vulnerabilities to terrorism." One of these was to develop a Federal Response Plan to deal with terrorist events involving WMD. Another was to develop a program for the training of public safety personnel to deal with these matters.

The HDS at RSA has been operating from the same facilities since 1971, when the first three week basic hazardous devices training class was held. The FBI assumed responsibility for training in 1981, and in 1983 the basic course was extended to four weeks. The expansion of the course to five weeks would result in a more intensive training program and also increase the current class frequency, which will result in more certified bomb disposal technicians available to address these random acts of violence.

1.1.3 Purpose of the Action. The current mission of the HDS is to combat bomb related criminal and terrorist acts through the training and certification of bomb disposal technicians. The extent to which this mission can be carried out is governed by the degree of real-world training exercises that students undergo during the certification process. The purpose of the Proposed Action is to increase the effectiveness and capacity of the current HDS mission by providing a more realistic training environment.

RSA requires ample area to accommodate new development and growth for Installation needs and mission requirements and an obligation to provide a safe environment for Installation personnel. The Proposed Action would serve the needs of the HDS by providing a more realistic setting for hands-on practical training and a much larger training area to accommodate larger classes. The development of more realistic training facilities will also help sustain state-of-the-art technology currently in place at RSA, in a combined effort to lead the world in fighting terrorist bombing activities.

The broad HDS operational mission would be maintained with the addition of the new facilities to replace existing facilities which would be returned to the Army for other

uses. This document would assist in tiering future environmental assessments where no, or only minor, mission changes occur.

1.1.4 Location. The existing HDD Range will continue to be used as part of the Proposed Action. Buildings 3445, 3446, and 3450, located in the U.S. Army OMMCS Headquarters area in the northeastern portion of RSA, will be vacated and returned to the Army for use. The proposed new training area is located on approximately 285 acres in the southeast portion of RSA. Approximately 215 acres are located north of Buxton Road, bordered by Redstone Road to the north, West Line Road to the west and East Line Road to the east (Figure 1-2). The remaining 70 acres are located south of Buxton Road, north of the existing HDD Training Area (Figure 1-3).

1.2 RELATED ENVIRONMENTAL DOCUMENTATION

Related environmental documentation reviewed for this EA include:

- U.S. Army Missile Command, 1994. *Final Environmental Assessment for Redstone Arsenal Master Plan Implementation*.

- Alabama Natural Heritage Program, 1995. *Draft Natural Heritage Inventory of Redstone Arsenal: Federally Listed Endangered, Threatened, Candidate and State-Listed Species*.

- Geonex Corp., 1995. *Mapping Report for United States Army, Redstone Arsenal*.

- U.S. Army Aviation and Missile Command, 1997. *Final Environmental Assessment of the U.S. Army Ordnance Missile and Munitions Center and School*.

1.3 AGENCIES INVOLVED IN ENVIRONMENTAL ANALYSIS

The Alabama State Historic Preservation Office (ALSHPO) and the Advisory Council on Historic Preservation (ACHP) have been consulted to determine their concerns regarding the Proposed Action (Appendix A). In addition, the U.S. Fish and Wildlife Service (USFWS) and the U.S. Environmental Protection Agency (USEPA) have been consulted to determine their concerns regarding the Proposed Action (Appendix A).

1.4 PUBLIC INVOLVEMENT

There will be a 30-day comment period after the Notice of Availability of the EA for the Development of a Hazardous Devices Training Facility on RSA is published in the local newspaper. Other Federal, state, and local agencies are not currently involved in the planning of this action.

There were no significant environmental issues determined through this EA process that would result in the need for an Environmental Impact Statement. All issues raised during the scope of the process have been identified within this assessment.

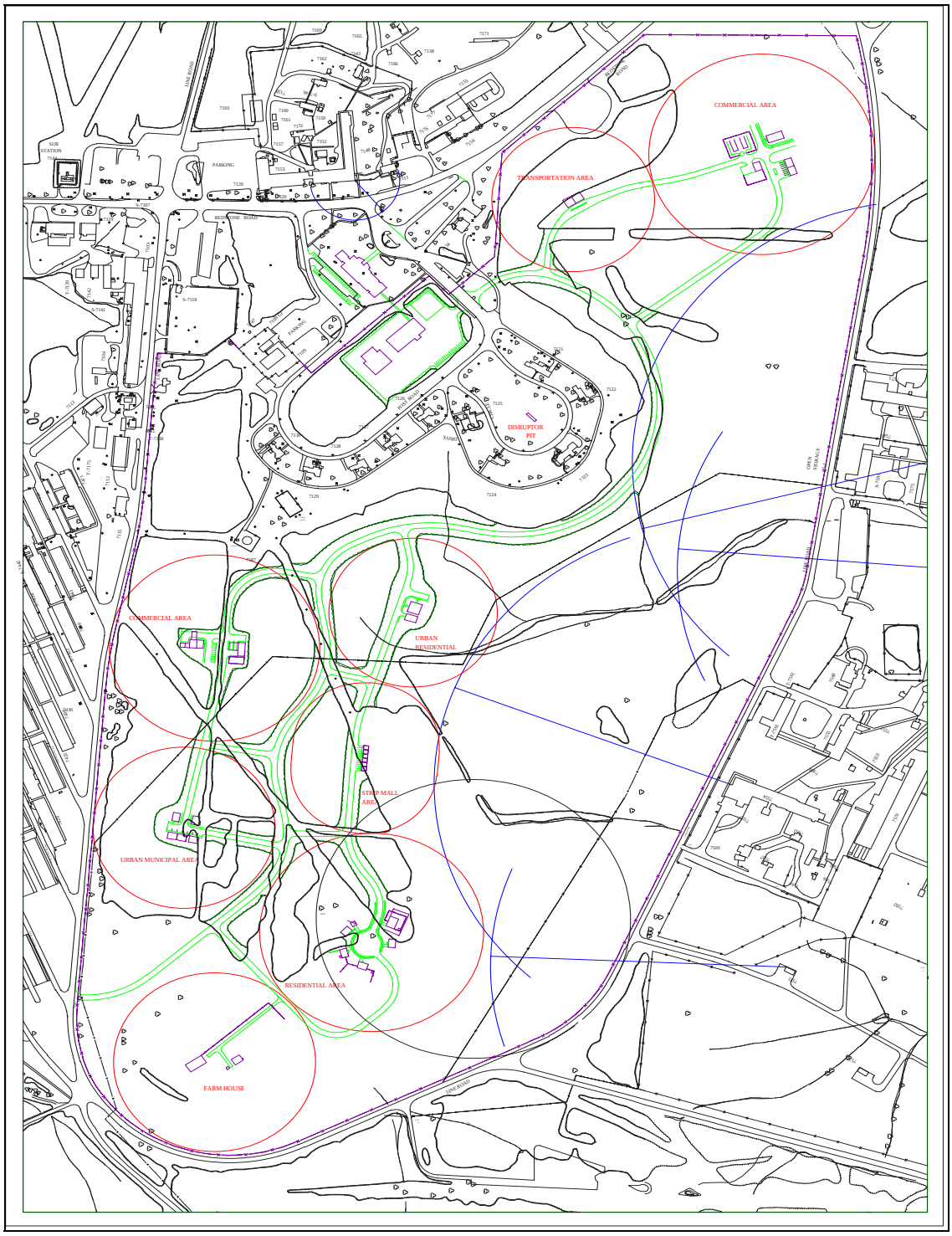

Figure 1-2
FBI Hazardous Devices Training Center, Redstone Arsenal, Alabama
Proposed Site North of Buxton Road

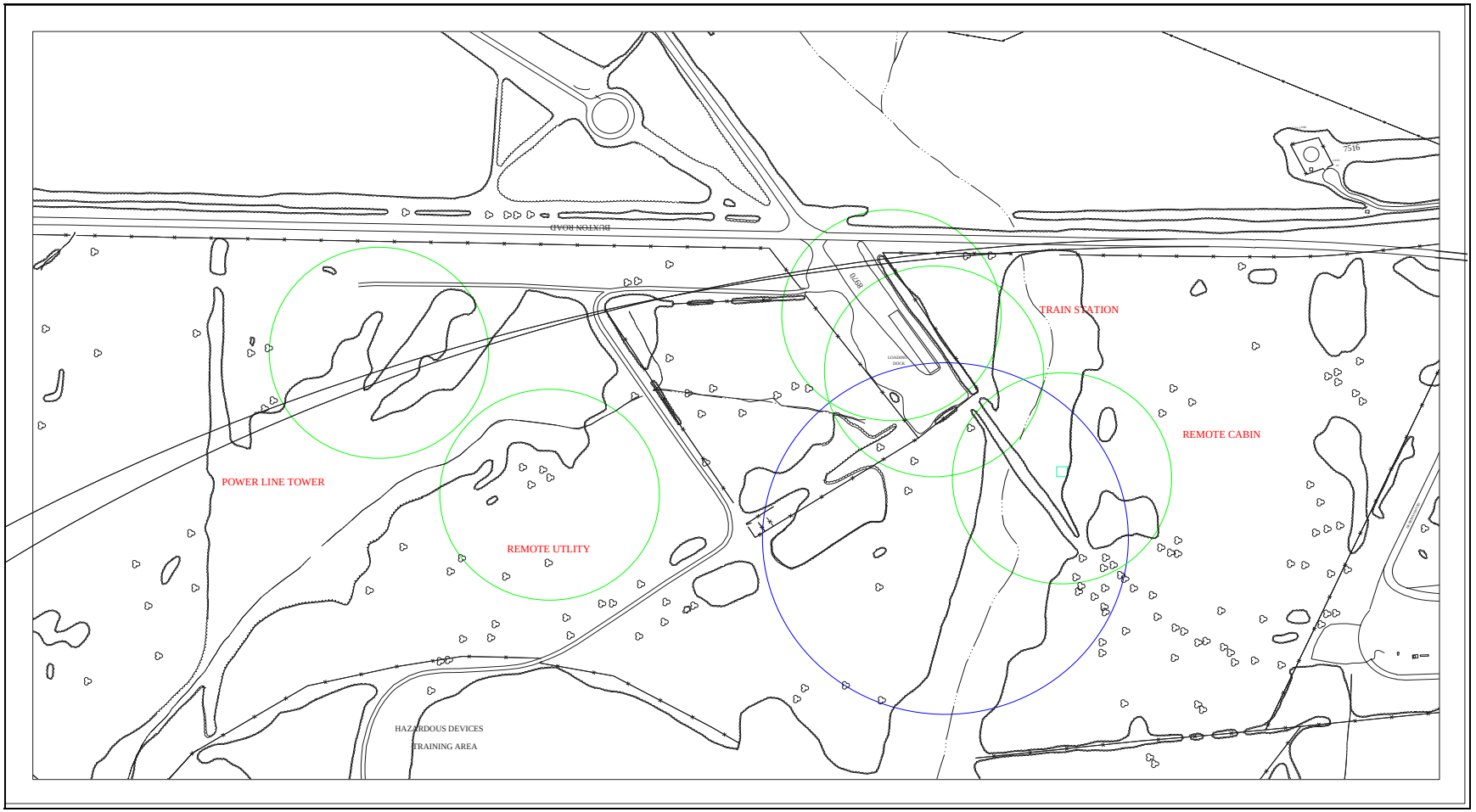

Figure 1-3
FBI Hazardous Devices Training Center, Redstone Arsenal, Alabama
Proposed Site South of Buxton Road

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 SUMMARY OF ALTERNATIVES

During the planning stage for the Proposed Action, the other alternatives considered were the No-Action Alternative and the Alternate Location Alternative. These alternatives, as well as the Proposed Action, were assessed for potential impacts to the environment and feasibility to the proposed project. Alternatives including the Proposed Action are described in the following sections.

2.2 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.2.1 Alternative 1 - Proposed Action. The action proposed by the HDS and evaluated in this EA includes the construction and implementation of a new HDTF, which would serve as headquarters and primary training grounds for the HDS. The Proposed Action would include the construction of a 29,000 square foot General Instruction Facility, a 15,500 square foot Operational Deployment Facility, a 9,000 square foot Instructor Support Facility, a Mock City/Training Area, eight disrupter firing pits, and necessary utility facilities. These new facilities would be located on a tract of land, north of Buxton Road, of approximately 215 acres. Another tract, south of Buxton Road, of approximately 70 acres, would be utilized primarily for field training using realistic training mock-ups. These mock-ups would be located at various locations around the range and no earth-moving activities would be necessary The current mission of the HDS would be maintained with the addition of these new facilities. Existing facilities, currently used by the HDS, would be returned to the Army for use. Capabilities of the HDS would be extended with the development of the new HDTF to offer more realistic training scenarios. Current staffing of the HDS is 24 personnel, the Proposed Action would require the addition of 14 to 16 additional staff members.

HDS facilities are currently located at various sites on RSA. Buildings 3445, 3446, and 3450 are located in the OMMCS Headquarters area in the northeastern portion of RSA where they are used for instruction, office space, storage, workshops, and laboratories. These activities will be transferred to the buildings proposed for construction in the HDTF area north of Buxton Road under the Proposed Action and the currently used buildings would be returned to the Army for use.

Currently, the HDS graduates approximately 400 students per year. The Proposed Action would allow a sustained student load of over 900 students per year. Therefore the Proposed Action would more than double the number of certified bomb technicians available to enter the workforce, substantially increasing the number of certified hazardous devices technicians able to combat terrorism in the United States and around the world.

2.2.1.1 HDD Range. Current training for hazardous devices disposal techniques is performed at the HDD Range. The existing HDD Range is an approximately 63 acre restricted training site located 1.5 miles east of Patton Road and south of Buxton Road, near the southeastern boundary of RSA. The Proposed Action would utilize an

additional 70 acres of land adjacent to and north of this existing area. The existing range is surrounded by a 327 acre exclusion zone (safety fan) controlled by AMCOM. Range roads are unimproved roadways. Several buildings are located on the existing site including Building 8976, used for classrooms and office space; Building T-8989, a temporary building used for storage; Bunker 8976A, used with firing range activities; and seven small metal buildings and a mobile home used as a training lab. Building 8968 (formally an ammunition bunker) and Building T-8969 are used for storage. These HDD Range buildings would be retained and used by the HDS.

The HDD Range is used to train civilian law enforcement and public safety personnel in the design, construction, safe render, and disposal of hazardous explosive devices. The range contains eight static training sites, nine firing points, disrupter pits, and a sand-filled demolition line. This range is used approximately 128 days per year for demolition instruction using both military and civilian explosives materials.

There are numerous static displays that were obtained from the Defense Reutilization Marketing Office (DRMO) located on the HDD Range. These displays are free of fluids (e.g., gas, oil, antifreeze) to prevent environmental pollution. Displays include a mailbox, cars, trucks, and an ambulance. The Proposed Action would add additional static training sites that, in the area north of Buxton Road, would include mock-ups for various commercial and urban scenarios (Figure 1-2). South of Buxton Road there are plans for realistic mock-ups for scenarios such as remote utilities/oil pipe-lines, a rail station, and a remote cabin (Figure 1-3).

Use of explosive devices used in the static displays is limited to small quantities of detonating cord (less than 8 inches) and blasting caps used in a Mineral Water Bottle (MWB) Device and 12 gauge shotgun shells used in disrupters. These devices are used in the training of hazardous explosive devices disabling.

A broad range of technical training and associated activities are conducted on the HDD Range. The HDD Range has approximately 400 students per year during course activities. Classes are one to four weeks in length and have approximately 16 to 24 students per class. Classes have instructor/student ratios of 1 : 24 in the classroom (up range), 1 : 3 at the firing points (range points), and 1 : 1 on the firing line (down range). Range classes include the "Basic Civilian Competence Confidence Course" and the "Civilian Competence Confidence Refresher Course."

There are no night/weekend bivouacs or field training exercises conducted on the range, and no bulk petroleum products are stored at the range.

2.2.2 Alternative 2 - No Action. Under the No-Action Alternative HDS operations would continue without the benefits of expanded and development of more realistic training facilities. The HDS training activities would continue as scheduled but the training areas would be restricted to the current status. Class sizes and frequency would increase, as anticipated under the Proposed Action, resulting in class overcrowding, staffing difficulties, and class fragmentation as widely scattered buildings and facilities across RSA would have to be utilized to absorb the increased student load. These restrictions would probably limit the sustained student load to approximately 600 per year.

2.2.3 Alternative 3 - Alternate Location. This alternative considered moving the HDS mission and operations to the Quantico U.S. Marine Base in Quantico, Virginia. This is the location of the FBI Academy, where the majority of FBI agent training currently takes place. Quantico was the only alternative location considered in the initial planning phases for the Proposed Action. This alternative was not feasible because the 385 acre site currently occupied by the FBI Academy at Quantico was not able to accommodate the additional requirements of the HDS. The HDS has operated for a period of 27 consecutive years at RSA. During this time, the HDS has established a reputation within the hazardous devices community which remains unsurpassed in the United States. As mentioned previously, the HDS is the only Certified Bomb Disposal Technician training school in America. Staff continuity is a vital aspect of the HDS program. Even if relocation to Quantico could provide adequate space and accommodations for the Proposed Action, staff continuity would be detrimentally impacted as new staff would need to be identified and trained resulting in potentially significant delays to full operational capability. Based on these considerations and other criteria addressed in the selection process, negative impacts from the relocation to Quantico were deemed significant enough to eliminate this alternative from further consideration.

3.0 AFFECTED ENVIRONMENT

This section describes the environment potentially affected by the Proposed Action. The affected environment is described to provide a context for understanding potential impacts. Components of the affected environment that are of greater concern are described in greater detail.

Available literature was acquired and reviewed. To fill data gaps and verify and update available information, RSA personnel as well as Federal, state, and local regulatory agencies were contacted. Cited literature, telephone interviews, and referenced materials are presented in Chapter 8.

Eleven broad environmental components were considered to provide a context for understanding the potential effects of the Proposed Action and as a basis for assessing the significance of potential impacts. Several of these environmental components are regulated by Federal and/or state environmental statutes, many of which set specific guidelines, regulations, and standards. These standards provide benchmarks for determining the significance of environmental impacts. The areas of environmental consideration are air quality, biological resources, cultural resources, hazardous materials and waste, health and safety, infrastructure and transportation, land use, noise, geology and soils, socioeconomics, and water resources.

Region of Influence (ROI) - The ROI for the majority of the resources considered in the Proposed Action is the area of approximately 285 acres located in the southeastern portion of RSA. One area, south of Buxton Road, is comprised of approximately 70 acres, and the other area, north of Buxton Road, is comprised of approximately 215 acres. Exceptions to this description of an ROI would be in such resource areas as Air Quality, Noise, Water Resources, and Socioeconomics which would obviously have the potential to extend beyond the borders of the described ROI. Effects to these resources have the potential to occur in the described ROI, as well as, RSA and the surrounding communities in Madison County, Alabama.

3.1 AIR QUALITY

Affected Environment - Existing air quality is determined through examination of air quality standards. Air quality standards are established and maintained through both state and Federal programs to protect human health and welfare. The purpose of this chapter is to identify those state and Federal programs that regulate maintenance of air quality in the ROI that would potentially be affected by activities associated with the HDTF.

3.1.1 Regulatory Overview

State and Federal air regulations potentially applicable to the Proposed Action at RSA located in Huntsville, Alabama include:

The Clean Air Act (CAA) of 1970 and the Clean Air Act Amendments (CAAA) of 1990 which authorize the Environmental Protection Agency (EPA) to develop programs for

the control and abatement of air pollution from the construction, reconstruction, or modification of air emission sources of regulated pollutants. The emphasis of these programs is to protect public health and welfare through maintenance of air quality standards for air pollutants.

3.2 BIOLOGICAL RESOURCES

Affected Environment - RSA is a single tract of land encompassing 37,9100 acres and is diverse in topography, flora, and fauna. Elevations range from approximately 570 feet above mean sea level (msl) in bottomlands to 1,200 feet msl in the mountainous regions of the Arsenal. Forest lands, rights-of-way, test areas, old-fields (abandoned open areas) in various stages of plant succession, in addition to developed areas, creeks, sloughs, and ponds provide abundant diversity in wildlife and fishery habitat on the Arsenal. This habitat diversity provides for greater fish and wildlife species diversity. Approximately one-third of RSA lies within the 100-year flood plain of the Tennessee River (U.S. Army Missile Command, 1994).

This section describes the biological resources of the areas identified for the Proposed Action north and south of Buxton Road by major biotic habitat. Information in this section comes from existing documentation and has not been completely field verified. Even though no exhaustive inventory of the flora and fauna of RSA has been done, the Alabama Natural Heritage Program (ALNHP) conducted a biological inventory of the Arsenal to determine the presence or potential presence of Federally listed and state tracked rare species of plants and animals (ALNHP, 1995). A summary table of ecological resources is also available in Appendix F of the *Final Environmental Assessment for Redstone Arsenal Master Plan Implementation* (U.S. Army Missile Command, 1994). The *Natural Resources Management Plan for Redstone Arsenal* (U.S. Army Missile Command, 1995) and the *Environmental Assessment of the Natural Resources Management Plan for Redstone Arsenal* (U.S. Army Missile Command, 1997a) are used as tiering documents for many of the resources described below.

Vegetation

A variety of native vegetation communities exists on RSA and Wheeler National Wildlife Refuge (WNWR) (approximately 4,000 acres of which are located on the Arsenal). A comprehensive listing of native vegetation within RSA boundaries is found in Appendix B of the *Natural Resources Management Plan for Redstone Arsenal*. Specific discussion of the vegetation resources for the ROI for this document is included below.

Three primary ecological units make up RSA: upland forests, grasslands, and wetlands. Upland forests consists of lands at elevations above approximately 570 feet msl. Grasslands are generally leased agricultural lands and also are usually above an elevation of approximately 570 feet msl. Wetland areas consist of permanently and occasionally inundated land and associated areas. These areas are primarily controlled by the Tennessee Valley Authority (TVA) Wheeler Dam flood control program and secondarily impacted by other factors including beaver activity.

Upland forest land consists of pine plantations, mixed hardwood and pine, and hardwood forests. These forests contain deciduous and evergreen trees including

loblolly, shortleaf, and Virginia pines, oaks, gums, and ash. Vines and shrubs found on the mostly young plantations include honeysuckle, blackberry, and trumpet creeper. This forested land provides good habitat for mammals, birds, and other wildlife including white-tailed deer, rabbits, squirrels, fox, woodchuck, turkey, owls, woodpeckers, turtles, snakes, and frogs.

Non-forest Lands

Hay and pasture lands encompass approximately 4,145 acres of RSA. The remaining acreage is comprised of semi-improved grounds (7,426 acres), old-field land, and wildlife openings.

Grasslands are primarily leased agricultural land used for cattle grazing. This habitat consists of a variety of grasses and graminoids including Kentucky 31 tall fescue, Kentucky bluegrass, common bermuda, Johnson grass, crab grass, orchard grass, Sudex, goose grass, Dallis grass, broom sedge, white and red clover, ragweed, and poke weed. Grasslands provide food and cover for mammals, birds, and other wildlife including opossum, woodchuck, coyote, dove, falcons, hawks, starlings, and snakes.

Forest Lands

According to the 1988 RSA forest inventory, 16,180 acres (approximately 42 percent of the Arsenal) are covered in forest: approximately 4,226 acres as pines; 5,528 acres as hardwoods; 3,181 acres as mixed pine-hardwoods; and 3,245 acres as mixed cedar-hardwoods. The forest is temperate and composed of over 100 tree species, of which 21 are designated as potential commercial forest product species.

Fish and Wildlife

Some of the most common mammals on RSA and WNWR are white-tailed deer, beaver, eastern cottontail rabbit, swamp rabbit, gray squirrel, fox squirrel, striped skunk, red bat, woodchuck, muskrat, opossum, raccoon, gray fox, and coyote (Weber, 1996). Over 250 bird species are residents or migrants on RSA. As many as 100 species may be encountered year round. There is the potential for over 100 species of fish to occur in RSA waters. Roughly half of these are considered to be abundant or common. (U.S. Army Missile Command, 1995) Reptile and amphibian species are well represented on RSA and WNWR lands. Fifty-one species of reptiles and twenty-nine species of amphibians are known to be present in the vicinity. A comprehensive listing of mammal, bird, fish, reptile, and amphibian species occurring on or in the vicinity of the Arsenal is presented in Appendix F of the *Final Environmental Assessment for Redstone Arsenal Master Plan Implementation* (MICOM, 1994).

There is the potential for any of the terrestrial wildlife species listed in the above referenced documents to occur either temporarily or permanently in the vicinity of the proposed HDTF north and south of Buxton Road. Fish and other aquatic species would not occur in the area under consideration north of Buxton Road as suitable habitat is lacking. Fish and other aquatic species could occur on the area south of Buxton Road due to the availability of streams and wetland areas in this portion of the ROI.

Those species which inhabit open lawns, pastures, and old field habitats, use areas around the existing structures in the area north of Buxton Road for forage/cover/resting habitat. Suitable nesting/den habitat for small mammals and song birds is also available in this area. Wildlife can move freely near any of the structures in this area. However, overall wildlife productivity and diversity around the structures is limited by the available habitat. Species such as white-tailed deer, rabbit, and other small mammals would typically use this area. The area south of Buxton Road has not been highly developed and consists of bottomlands, pine plantations mixed with hardwoods, and open pasture lands. Several wildlife species, large and small, would find suitable habitat in this area for all aspects of their life-cycle.

Aquatic Habitats

RSA is located on the north bank of the Tennessee River about 46 miles above Wheeler Dam and 17 miles downstream from Guntersville Dam. Huntsville Spring Branch (HSB), with a drainage area of 86 square miles, originates in springs and creeks of nearby mountain slopes, and flows southward through the urban areas of the City of Huntsville. HSB receives most of its run-off from developed areas within the central portion of the city, and some from the forested headwaters of Monte Sano and Chapman Mountains. The branch then enters a swampy area in the northeast corner of the Arsenal at Mile 10 and flows southwestward to join Indian Creek, a tributary of the Tennessee River. Indian Creek, which enters at the northern boundary of the Arsenal, drains an area of 143 square miles. It joins the Tennessee River at Mile 321.

The area south of Buxton Road contains two small, first-order streams and associated surrounding wetland areas. No significant aquatic resources are located in the area of the Proposed Action north of Buxton Road.

Threatened and Endangered Species

Biological resources warranting special protection include threatened and endangered species. Under the Endangered Species Act, Federal agencies are prohibited from jeopardizing threatened or endangered species or adversely modifying habitats essential to their survival. Alabama ranks forth in the nation (after California, Hawaii, and Florida) in the number of Federally listed endangered and threatened plants and animals.

There is the potential for threatened or endangered faunal species found in or around the Arsenal to temporarily occupy the areas north or south of Buxton Road described in the Proposed Action. No known threatened or endangered floral or faunal species are currently known from these areas. Habitat bounding the western edge of the current HDD Range is suitable for the Federally listed as endangered gray bat and the threatened bald eagle, both of which use the Installation for feeding and resting.

Wetlands

For an area to be classified as a Clean Water Act (CWA) (Section 404 [b]) jurisdictional wetland, evidence of three parameters are required (U. S. Army Corps of Engineers, 1987). These parameters are the presence of hydrophytic vegetation, hydric soils, and

wetland hydrology. Hydrophytic vegetation can be described as plant life growing in water or in a substrate that is, at least periodically, deficient in oxygen as a result of excessive water content. Hydric soils are soils that have been saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in their uppermost layer. Wetland hydrology requires that the potential wetland area be inundated or have a water table within inches of the ground surface for a specified period.

Wetlands on RSA are home to a large number and variety of plant and animal species. About 26 percent of the installation is covered by wetlands. The wetlands are mostly associated with creeks or spring runs that are easily effected by the elevation of the Tennessee River and have bottomland hardwood forests associated with the Tennessee River and its major tributaries. The water levels in the Tennessee River and its tributary system fluctuate seasonally according to the flood control mission of Wheeler Dam. Beaver activity influences water levels in the northwest side of the HDD Range.

Detailed jurisdictional wetland maps for the installation were not available for this analysis, however, National Wetlands Inventory (NWI) maps for wetland types in Madison County, prepared by the USFWS were used. These non-jurisdictional maps were constructed from photo interpretations of aerial photography and were verified by spot ground-truthing. Recent work (Geonex, 1995) reports the total wetland acreage of the Arsenal to be 9,889.5 acres. Table 3-1 provides a summary of the wetlands and acreage by major wetland type within the installation boundary from this work.

Wetland areas support a variety of plant life including tupelo, water oak, willow oak, black gum, eastern cottonwood, red maple, black willow, dogwood, pepperbush, lily pads, and aquatic grasses. Wetland areas house an abundant array of mammals, reptiles, amphibians, fishes, and invertebrates including beaver, muskrat, cottonmouth moccasin, water snakes, frogs, salamanders, turtles, bluegill, bass, crappie, catfish, and carp. WNWR attracts many species of waterfowl, such as ducks and geese, and provides wintering habitat for migrating flocks.

About half of the Arsenal wetlands are under WNWR jurisdiction. RSA's obligation is to oversee construction projects near any wetlands and to provide protection for both WNWR and installation wetlands and mitigate any problems caused by construction in or near these areas. Wetland areas in the ROI south of Buxton Road are primarily associated with the two small, first-order spring-fed streams. One stream borders the west side of the HDD Range and forms a significant wetland (Tupelo swamp). The other spring-fed stream, located on the east side of the Range, forms a smaller wetland, largely influenced by beaver activity. The vegetation associated with these areas is primarily bottomland hardwood forest vegetation. No wetland areas exist in the portion of the ROI north of Buxton Road.

TABLE 3-1
WETLAND TYPES ON REDSTONE ARSENAL

Wetland Type	Acreage (Rounded to nearest 1/10 acre)
Palustrine emergent (PEM)	1,213.7
Palustrine forested (PFO)	6,381.7
Palustrine aquatic beds (PAB)	2.4
Palustrine scrub-shrub (PSS)	1,057.6
Palustrine unconsolidated bottoms (PUB)	62.8
Palustrine unconsolidated shoreline (PUS)	7.0
Palustrine overlapping types (Pmulti)	400.3
Lacustrine types (all)	668.5
Riverine/Stream types (all)	95.5
Total	**9,889.5 acres**

Source: Data from Geonex, 1995

Unique Habitats

Biological resources warranting special protection include species that occupy unique habitats. There are several locations throughout RSA that fall under these categories (ALNHP, 1995) including several aquatic and terrestrial cave communities, springs, and bluffs. There are no unique habitats known to be on the approximately 285 acre area north and south of Buxton Road being considered under the Proposed Action.

3.3 CULTURAL RESOURCES

Affected Environment - Cultural resources consist of prehistoric and historic districts, sites, structures, artifacts, and any other physical evidence of human activity considered important to a culture or community for scientific, traditional, religious, or other reasons. Cultural resources are divided into three categories: archaeological (prehistoric and historic), historic resources and structures, and traditional (e.g., American Indians or other ethnic groups).

Prehistoric archaeological resources are defined as physical remnants of human activity that predate the advent of written records in a particular culture and geographic region. They include archaeological sites, structures, artifacts, and other evidence of prehistoric behavior.

Historic resources consist of physical properties or locations postdating the advent of written records in a particular culture and geographic region. They include archaeological sites, structures, artifacts, documents, and other evidence of human behavior. Historic resources also include locations associated with events that have made a significant contribution to history or that are associated with the lives of historically significant persons.

Traditional native resources may be prehistoric sites and artifacts, historic areas of occupation and events, historic and contemporary sacred areas, materials used to produce implements and sacred objects, hunting and gathering areas, and other

botanical, biological, and geological resources of importance to contemporary Native American groups.

The Arsenal is divided into three topographic or landform zones that possess varying degrees of archaeological potential. Zone 1 is composed of rolling land combined with flat plateaus that have undergone considerable erosion and is considered to have low to moderate archaeological potential. Zone 2 is made up of the flood plains on the Arsenal and is considered to have high archaeological potential. Zone 3 is composed of mountainous land and is considered to have low archaeological potential. (U.S. Army Missile Command, 1994)

Cultural and archaeological resources are limited, nonrenewable resources whose potential for scientific research or value as a traditional resource may be easily diminished by actions that significantly impact the integrity of the property. Activities that disturb the ground in which an archaeological site is present can destroy temporally and culturally diagnostic artifacts and features or alter artifact provenance. The intensity and context of the alteration of the distinctive characteristics and integrity of a property determine significance of impacts.

The prehistory of RSA spans the time range from circa 12,000 B. C. until European contact (approximately 1800), and there are now 349 known archaeological sites recorded on RSA. RSA has yielded a number of particularly significant Paleo-Indian period sites (from 8,000 to 12,0000 B. C.). The Redstone Point, an identified Clovis point linked to the Paleo-Indians, is named for an example found on RSA. Native American occupation of the Arsenal area is believed to have been nearly continuous through the late Mississippian Period (A. D. 899-1500), at which time Native American populations declined in the area. Although the historic Chickasaw established a village on Hobbs Island (in nearby Huntsville) by at least the late 1760s, inter-tribal rivalries between the Chickasaws and Cherokees essentially turned the RSA area into a "no man's land." The 1786 Treaty of Hopewell placed the boundary line between the Chickasaws and Cherokee directly through the middle of Madison County. This area was opened up for American settlement in the early 1800s, and the City of Huntsville was incorporated in 1811. Both the Chickasaw and Cherokee tribes were completely removed from northeast Alabama by 1832.

From the establishment of Madison County in the early 1800s until the beginning of World War II in 1941, the RSA area was occupied by a number of small subsistence farms. A number of small agrarian, rural communities were located in this portion of Madison County. The rich soils of the area, the railroad transportation routes of the Memphis and Charleston Railroad (running east-west) and the Nashville and Decatur Railroad (running north), and the river transportation offered by the Tennessee River combined to make Madison County a productive and wealthy agricultural area. The Memphis and Charleston Railroad continues to operate on the antebellum route, today owned and operated by the Norfolk Southern Railroad.

In 1941, the U. S. government condemned 37,000 acres of land southwest of Huntsville, and construction began on the Huntsville Chemical Warfare Service (CWS) facility on August 4, 1941. By 1942 there would be three actual facilities at Huntsville. Huntsville Arsenal provided the logistical, administrative, housing, and maintenance services for

the base, in addition to manufacturing areas. Redstone Ordnance Plant, operated by the Ordnance Department, fabricated munitions. The Gulf Chemical Warfare Depot (GCWD), operated by the CWS, was responsible for the storage of a number of chemical agents.

Following World War II, RSA was temporarily inactivated. In fact, several manufacturing lines were never placed into production. Portions of the base were closed, and a number of buildings were sold. Several private industries leased or purchased a number of the World War II facilities.

This brief period of inactivity came to an end in 1950, when RSA's large area, excellent transportation infrastructure, and proven chemical production facilities resulted in the Arsenal's re-activation as the Nation's rocket and missile research center. In 1951, RSA was assigned the national responsibility for rocket and missile research, development, and testing.

The Cold War (1946-1989) is a term that describes the tense, strained relations which existed between the United States and the Union of Soviet Socialist Republics (USSR). This period occurred between the end of World War II and the collapse of the USSR. This period saw a rebirth of what is now RSA and included the consolidation of Redstone Arsenal, Huntsville Arsenal and the GCWD. The union of installations brought a change in mission, as the Army consolidated its missile/rocket research and manufacturing assets. Because of RSA's successful involvement in numerous rocket and missile programs during the Cold War era, related U. S. Army commands were subsequently established at the Arsenal. These include the U. S. Army Missile Command (recently combined with the U.S. Army Aviation and Troop Command to form AMCOM), OMMCS, and Redstone Technical Test Center (RTTC). Late in 1959, the National Aeronautical and Space Administration (NASA) established Marshall Space Flight Center (MSFC) on RSA. NASA, AMCOM, OMMCS and RTTC continue their missions at RSA today. Although a tenant organization of RSA, NASA is responsible for NEPA and National Historic Preservation Act (NHPA) compliance for the structures and facilities on MSFC.

In order to describe the existing cultural resources in the ROI of the Proposed Action, two surveys were performed in conjunction with the preparation of this EA. These were a Phase I Archaeological Survey and a Determination of Eligibility for the National Register of Historic Places.

Phase I Archaeological Survey

The Phase I Archaeological Survey of the proposed HDTF on Redstone Arsenal, Madison County, Alabama, was conducted in February and March 1998. The survey area encompassed the approximately 285 acres in the southeast portion of the Arsenal under consideration for use in the Proposed Action. The survey, laboratory analysis of recovered material, and report generation were performed in accordance with the Policy for Archaeological Survey and Testing in Alabama (Alabama Historical Commission, 1996).

The purpose of this investigation was to identify archaeological resources within the proposed impact zones listed on, and provide recommendations for those eligible or potentially eligible for inclusion on, the National Register of Historic Places (NRHP) pursuant to the criteria set forth in 36 CFR60.4 Section 106, and Section 110(a)(2) of the National Historic Preservation Act. The survey areas are listed in Table 3-2.

TABLE 3-2
SURVEY AREAS

Area	Township	Range	Section	USGS 7.5' Alabama Quad
North	5 South	1 West	S ½ of SE ¼ of SE ¼ of 11, SE ¼ of SW ¼ of SE ¼ of 11, NE ¼ of 14, E ½ of SW ¼ of NW ¼ of 14 SW ¼ of NE ¼ of NW ¼ of 14 E ½ of NE ¼ of SW ¼ of 14 NW ¼ of SE ¼ of 14	Farley 75-SE
South	5 South	1 West	NW ¼ of NE ¼ 23 E ½ of NE ¼ of NW ¼ of 23 W ½ of NE ¼ of NE ¼ of 23	Farley 75-SE

Eight archaeological sites were recorded and four previously recorded archaeological sites were revisited within the survey area. Five isolated finds including prehistoric and historic artifacts were also recovered. A synopsis of each site is included in the following text. For a more detailed representation of the sites, the reader should refer to the *Phase I Archaeological Survey of a Proposed Hazardous Devices Training Area on Redstone Arsenal, Madison County, Alabama* (1998). A copy of this report is located with the Natural and Cultural Resources team in the Directorate of Environmental Management and Planning Office and may be reviewed by persons with a need to know.

Site 1Ma480 is an undetermined prehistoric minimal density lithic scatter with Paleoindian and Late Archaic/Early Woodland components. The site has been heavily impacted by cultivation, erosion, and construction. Based on the results of this survey, Site 1Ma480 is recommended ineligible for NRHP nomination. Due to the eroded and disturbed nature of the area of Site 1Ma480, no further archaeological testing is recommended.

Site 1Ma515 is an undetermined prehistoric minimal density lithic scatter that has been destroyed by erosion, cultivation, and construction. Based on the results of this survey, Site 1Ma515 is recommended ineligible for NRHP nomination. Due to the eroded and disturbed nature of the area of Site 1Ma515, no further archaeological testing is recommended.

Site 1Ma517 is a nineteenth to twentieth century historic artifact scatter and an undetermined prehistoric minimal density lithic scatter. The site has been impacted by erosion, cultivation, and construction of power lines. Based on the results of this survey, Site 1Ma517 is recommended ineligible for NRHP nomination. Due to the eroded and disturbed nature of the area of Site 1Ma517, no further archaeological testing is recommended.

Site 1Ma657 is an undetermined prehistoric minimal density lithic scatter and late nineteenth to early twentieth century historic structure site. The site contains cut limestone blocks and a probable chimney foundation which suggest the presence of intact historic features, such as structure foundations, outbuildings, privy, well or cistern, and residential activity areas. Based on the results of this survey, Site 1Ma657 is recommended potentially eligible for NRHP nomination. Site 1Ma657 should be avoided. If this option is not feasible, additional archaeological testing must be performed to recover a sample of the cultural materials present and define the site's potential NRHP significance.

Site 1Ma760 is a late nineteenth to early twentieth century historic artifact scatter. The area has been heavily impacted by erosion, construction, and soil borrowing. Based on the results of this survey, Site 1Ma760 is recommended ineligible for NRHP nomination. Due to the eroded and disturbed nature of the area of Site 1Ma760, no further archaeological testing is recommended.

Site 1Ma761 is a late nineteenth to middle twentieth century historic structure site containing a house mound with cut limestone blocks and a chimney foundation. The site potentially contains intact historic features, such as structure foundations, outbuildings, privy, well or cistern, and farm activity areas. Based on the results of this survey, Site 1Ma761 is recommended potentially eligible for NRHP nomination. Site 1Ma761 should be avoided. If this option is not feasible, additional archaeological testing must be performed to recover a sample of the cultural materials present and define the site's potential NRHP significance.

Site 1Ma762 is a late nineteenth to middle twentieth century historic artifact scatter. The area has been heavily impacted by erosion, construction, cultivation, and soil borrowing. No structure foundations or depressions were observed that would suggest the presence of intact historic features. Based on the results of this survey, Site 1Ma762 is recommended ineligible for NRHP nomination. Due to the eroded and disturbed nature of Site 1Ma762, no further archaeological testing is recommended.

Site 1Ma763 is a late nineteenth to middle twentieth century historic structure site with a Middle to Late Woodland minimal density artifact scatter. Observable evidence includes two exposed cut limestone blocks, a small mounded area, and ornamental plants. The site potentially contains intact historic features, such as structure foundations, outbuildings, privy, well or cistern, and farm activity areas. The grit tempered prehistoric ceramics suggest a Woodland farmstead may be present on the eastern perimeter of the site overlooking the drainage channel. Based on the results of this survey, Site 1Ma763 is recommended potentially eligible for NRHP nomination. Site 1Ma763 should be avoided. If this option is not feasible, additional archaeological testing must be performed to recover a sample of the cultural materials present and define the site's potential NRHP significance.

Site 1Ma767 is a historic structure site with isolated undetermined prehistoric material. Red brick, a cut limestone pier, and a dark soil layer uncovered in a shovel test suggest that a structure once stood on the site. The site potentially contains intact historic features, such as structure foundations, outbuildings, privy, well or cistern, and farm

activity areas. Timber cutting and cultivation have impacted the site. Based on the results of this survey, Site 1Ma767 is recommended potentially eligible for NRHP nomination. Site 1Ma767 should be avoided. If this option is not feasible, additional archaeological testing must be performed to recover a sample of the cultural materials present and define the site's potential NRHP significance.

Site 1Ma768 is a late nineteenth to middle twentieth century historic structure site which contains an arrangement of stone blocks, a cut limestone chimney foundation, and ornamental shrubbery. The site potentially contains intact historic features, such as structure foundations, outbuildings, privy, well or cistern, and farm activity areas. Based on the results of this survey, Site 1Ma768 is recommended potentially eligible for NRHP nomination. Site 1Ma768 should be avoided. If this option is not feasible, additional archaeological testing must be performed to recover a sample of the cultural materials present and define the site's potential NRHP significance.

Site 1Ma769 is a late nineteenth to middle twentieth century historic structure site that contains cut limestone blocks and ornamental plants. An 1882 Portuguese coin was recovered from a shovel test. The site potentially contains intact historic features, such as structure foundations, outbuildings, privy, well or cistern, and farm activity areas. Based on the results of this survey, Site 1Ma769 is recommended potentially eligible for NRHP nomination. Site 1Ma769 should be avoided. If this option is not feasible, additional archaeological testing must be performed to recover a sample of the cultural materials present and define the site's potential NRHP significance.

Site 1Ma771 is a middle to late nineteenth century historic structure site with cut limestone foundation stones, brick fragments, a cistern or well 3 m by 2 m, and ornamental plants. The site potentially contains intact historic features, such as structure foundations, outbuildings, privy, well or cistern, and farm activity areas. Based on the results of this survey, Site 1Ma771 is recommended potentially eligible for NRHP nomination. Site 1Ma771 should be avoided. If this option is not feasible, additional archaeological testing must be performed to recover a sample of the cultural materials present and define the site's potential NRHP significance.

Determination of Eligibility Survey

In 1995, Panamerican Consultants Inc. was hired to complete a reconnaissance level survey of World War II-era buildings and structures at RSA. The findings of this survey were published in a 1997 report entitled, *Architectural Assessment of the World War II Military and Civilian Works, U.S. Army Missile Command, Redstone Arsenal, Madison County, Alabama.* This report identified five districts and one individual property as potentially eligible for listing on the NRHP. One of these potentially eligible districts was the South Plant, Line 3, located within the ROI of the Proposed Action. In their conclusion about Line 3, the report stated that, "An intensive-level architectural survey will need to be completed on Line 3 to nominate it to the NRHP." This intensive survey has yet to take place and the exact National Register status of this area has not been determined.

To determine if existing structures within the ROI, proposed for use in the Proposed Action, possess potential historical architectural significance, a Determination of

Eligibility investigation was performed during March 1998 on these structures (Appendix B). These structures are in a former Administrative Area (7100 Area) located in the northwestern portion of the ROI of the Proposed Action. This Administrative Area was constructed in 1942 as part of the Redstone Ordnance Plant during World War II. The Administrative Area currently consists of five dwellings built in 1942 and five dwellings built in 1946. These buildings were occupied as officers' quarters until recent years and they are currently vacant. Redstone Arsenal is currently in consultation with ALSHPO regarding the eligibility of these buildings as a district. RSA proposes that because of the extensive alteration of the buildings during the mid 50s and 80s, the buildings no longer have integrity and do not meet the criteria of the NRHP. Vinyl siding was also added to the exterior of the houses, further diminishing the integrity of the houses. ALSHPO is not ready to concur that the houses are not eligible, and RSA is in the process of gathering additional information requested by ALSHPO.

Significance of Redstone Arsenal's First Commander, Colonel Carroll D. Hudson

During World War II, the Arsenal Commander, Colonel Carroll D. Hudson, occupied quarters 7123 in the Administrative Area. Colonel Hudson and his family resided in this dwelling from September of 1942 until the end of the war. Hudson was born in 1899 and was commissioned into the Army's Ordnance Department in 1926. In December of 1940, he was assigned to the Ammunition Division of the Office, Chief of Ordnance. Promoted to Major, Hudson was given command of RSA in September of 1941. As the Arsenal's first Commanding Officer, Hudson was responsible for the planning, construction, and operation of the Installation. Hudson was an effective leader and administrator and RSA was noted for its efficiency and productivity. In March of 1944, Hudson was promoted to Colonel and he oversaw the expansion of the plant facilities in 1945.

Following World War II, Hudson was reassigned as Commanding Officer of Joliet Arsenal in Illinois and later served at various installations in the Pacific. In November of 1948, Hudson began a second tour as Commanding Officer at RSA. From 1948 until 1952, Colonel Hudson helped the Arsenal through a large new construction program and the development of production lines for guided missiles and rockets. He served at the Arsenal for an additional four years and retired in 1954. Hudson died on June 4, 1992.

3.4 HAZARDOUS MATERIALS AND WASTE

Hazardous Materials

Regulatory agencies have defined hazardous material as applied to specific situations. The broadest and most applicable definition is specified by the Department of Transportation (DOT) for regulation of transportation of hazardous materials on public roads. DOT defines a hazardous material as a substance or material which is capable of posing an unreasonable risk to health, safety, or property when transported in commerce and has been so designated (49 CFR 171.8). There are no public roads on RSA, and no off-site transportation of hazardous materials is anticipated from the Proposed Action.

Several Federal agencies oversee hazardous material usage. DOT regulates packaging and transporting of hazardous materials in 49 CFR parts 171 through 180 and Part 397. Occupational Safety and Health Administration (OSHA) regulates the use of hazardous materials in the workplace in 29 CFR, primarily Part 1910. EPA regulates environmental safety and public health issues associated with hazardous materials through specific criteria applied to areas such as air emissions and water discharge.

The Proposed Action is not anticipated to use hazardous materials other than petroleum products normally associated with vehicle operations, small quantities of paints, and standard household cleaning chemicals (personnel communication with R. Funderburg).

Asbestos-Containing Materials and Lead-Based Paint

Historically, asbestos has been used in literally hundreds of products. Collectively, these products are frequently referred to as asbestos-containing materials (ACM). Asbestos gained widespread use because it was plentiful, readily available, low in cost, and had unique properties. It does not burn, is strong, conducts heat and electricity poorly, and is impervious to chemical corrosion. Asbestos surveys have been conducted throughout the Arsenal on various occasions.

Lead was used in many paints applied before the early 1980's. It was also used in piping, cable sheaths, batteries and solder. Lead is regulated in the workplace for exposure to workers although most documented health effects relate to pregnant women and children where exposure has been correlated with birth defects and learning difficulties. As a result of these risks, there has been a large scale lead abatement program within public buildings over the last few years in the U.S.. The requirements for workers to follow dust control techniques and respiratory protection normally only become effective when paint containing lead is abraded or the structure is demolished. (The Environmental News, 1995) There are several buildings that are suspected to contain lead-based paint (LBP) since they were constructed in the 40's and 50's. It is commonly accepted that structures that were built prior to 1978 are suspected to contain LBP, however, through the years most LBP that has not been abated has been painted over with oil and/or latex-based paints.

The former Administrative Area, planned for use in the Proposed Action for various training scenarios, has recently undergone surveys to determine if ACM or LBP are present. Results of these surveys were not available at the time of this writing.

Explosive Materials

Use of explosive devices for the HDTF is limited to small quantities of detonating cord (less than 8 inches) and blasting caps used in a Mineral Water Bottle (MWB) Device and 12 gauge shotgun shells used in disrupters. These devices are used in the training of hazardous explosive devices disabling. The effective range for the MWB is a radius of approximately 12 to 18 inches from the device. When the MWB is triggered the water (approximately 140 ml) in the MWB is expelled at a high velocity in an attempt to disrupt the firing mechanism of the suspected explosive device. The same results are expected from use of the disrupters, except that these devices focus the disruptive blast in a linear fashion from the end of the device.

Hazardous Waste

Waste materials (less commonly referred to as solid waste) are defined in 40 CFR 261.2 as, "any discarded material (i.e., abandoned, recycled, or 'inherently waste-like')" that is not specifically excluded. This can include both solid and containerized liquid materials. Hazardous waste is further defined in 40 CFR 261.3 as any solid waste not specifically excluded that meets specific concentrations or has certain toxicity, ignitability, corrosivity, or reactivity characteristics. Hazardous waste oversight is provided primarily by the EPA (as mandated by Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and Superfund Amendments and Reauthorization Act (SARA)). EPA regulations are found in 40 CFR. DOT regulates hazardous waste transportation. DOT requirements are found in 49 CFR.

3.5 HEALTH AND SAFETY

Affected Environment - Health and safety includes consideration of any activities, occurrences, or operations that have the potential to affect one or more of the following.

- The well being, safety, or health of workers - Workers are considered persons directly involved with the operation or who are physically present at the operational site.

- The well being, safety, or health of members of the public - Members of the public are considered persons not physically present at the location of the operation, including workers at nearby locations who are not involved in the operation and the off-installation population.

OSHA is responsible for protecting worker health and safety in non-military workplaces. OSHA regulations are found in 29 CFR 1910. Protection of public health and safety is an EPA responsibility and mandated through a variety of laws such as RCRA, CERCLA/SARA, CWA and the CAA. EPA regulations are found in 40 CFR 265.382. Additional safety responsibilities are placed on the DOT in 49 CFR. Department of the Army program requirements are outlined in AR 385-100.

Standard Operating Procedures (SOPs) are currently in place which provide students and instructors with guidelines, when followed, provide a safe operating environment. These SOPs are maintained and updated as necessary.

3.6 INFRASTRUCTURE AND TRANSPORTATION

Affected Environment - Infrastructure addresses those facilities and systems that provide power, water, wastewater treatment, the collection and disposal of solid waste, fire, health, and police services to RSA.

Transportation addresses the modes of transportation (air, road, rail, and marine) that provide circulation within and access to the installation. The transportation baseline sections that follow the infrastructure sections describe the existing conditions and,

where appropriate, the capacities of the various transportation modes in and around RSA.

Power

Electrical service is provided by the TVA through a number of local distribution companies. Substantial excess capacity is available within the Tennessee Valley to provide electrical service to meet all current and foreseeable requirements. The City of Huntsville provides electricity and water through Huntsville Utilities. Natural gas is provided by North Alabama Gas, through Huntsville Utilities, and is the primary fuel for boilers and heating plants.

Water

RSA derives the majority of its water supply from the Tennessee River. Potable water is supplied from two treatment plants on the Arsenal. The primary industrial water source is Water Treatment Plant #1. The potable water distribution network consists of two separate systems: An upper level system that supplies water to the areas of higher elevations on the northern portions of the Arsenal and a lower level system that supplies water to the remainder of the Arsenal including the ROI. Potable water is stored using five elevated steel tanks, five steel standpipes, and one concrete standpipe. This equipment is capable of storing a combined total of 2.585 million gallons. Arsenal storm-water drainage is conveyed to the Tennessee River via McDonald Creek, HSB, and Indian Creek. The southern portion of the Arsenal drains directly into the Tennessee River. (U.S. Army Missile Command, 1994)

Solid Waste

RSA operates a 73-acre solid waste disposal landfill, permitted by the State of Alabama, for the disposal of inert material consisting of rocks, concrete construction materials, asphalt, and construction debris including tree stumps and asbestos. The landfill has a one mile unpaved perimeter road. The landfill stopped accepting municipal waste (garbage) in 1992, when the Huntsville Solid Waste Disposal Authority's incinerator started operating. The equipment used to manage the landfill includes one dust control water truck, two bulldozers, a compactor, and a front-end loader. Trash and garbage generated on the Arsenal is hauled off-post for disposal. The majority of the waste is taken to the Huntsville Solid Waste Authority Waste-to-Energy Plant adjacent to RSA.

Roads

RSA has a well-developed roadway network for easy ingress and egress in three directions (the Tennessee River forms the southern border of the Arsenal preventing roadway access in that direction). The primary links in the network carry traffic to and from the Arsenal and serve as arterials for traffic movement through the area. Major north-south roads are Rideout, Patton, and Toftoy. Major east-west roads are Goss, Martin, Buxton, and Redstone. All of the major roads have paved, all-weather surfaces and are in good condition. The northern portion of the ROI is bordered by Redstone Road to the north, West Line Road to the west and East Line Road to the east. Other existing paved roads in the northern area were associated with the former

Administrative Area and are currently not used for significant traffic flow. These roads are in good condition. The southern portion of the ROI is bordered by Buxton Road to the north. Currently, gravel roads off Buxton Road provide access to this portion of the ROI.

Rail

Use of rail facilities was largely discontinued on RSA in 1973. Most of the tracks have been removed, and only two small sections of rail remain on the Arsenal. One portion of track, less than a mile in length, is located near Patton and Redstone Roads. The second section of rail is the Southern Railway Classification Yard located in the northwestern portion of the Arsenal, west of Rideout Road. No rail requirements exist for the Proposed Action.

Air

The RSA Airfield, controlled by AMCOM, provides research and development aircraft support and administrative aviation support to AMCOM, RSA, various tenant activities, Space and Missile Defense Command, and Readiness Group Redstone. Redstone Army Airfield has a north-south, 7,310-foot-long and 150-foot-wide hard surface runway with concrete approaches. The runway can accommodate any aircraft in the U.S. Army's inventory used for transportation and personnel. Both military and civilian aircraft use the airfield, although civilian aircraft require special advanced permission to use the field. No identified air requirements exist for the Proposed Action.

3.7 LAND USE

Affected Environment - Buildings in the northern portion of the ROI were constructed in the early 1940's and served as the initial Redstone Ordnance Plant's administrative and housing area. The current use of the southern portion of the ROI is as an exclusion zone for the existing HDD Range. Portions of this area are out-leased for cattle grazing.

3.8 NOISE

Affected Environment - Noise is usually defined as sound that is undesirable because it interferes with speech and hearing, can damage hearing, or is otherwise annoying. Sound pressure magnitude is measured in decibels (dB). The basic instrument for sound measurement is a sound-level meter for measuring dBA where "A" denotes that the meter is fitted with a frequency-weighting circuit that roughly matches the sensitivity of the human ear. RSA has an Installation Compatible Use Zone (ICUZ) Program to identify noise-generating areas on the Arsenal and to minimize encroachment of noise sensitive activities both on and off the Arsenal. It is not intended to inhibit operations but to inform community officials of the expected noise generation from mission-related activities. RSA is divided into three ICUZ noise zones. Residential housing, schools, churches, and other noise sensitive land uses are located in Zone I. These land uses are considered to be marginally acceptable in Zone II, and unacceptable in Zone III (Table 3-3). The area of the Proposed Action north and south of Buxton Road is located in Zone I. Army facility planners work with the community governments and planning agencies to

promote adequate buffer zones between the Installation's noise sources and the noise-sensitive areas. (U.S. Army Missile Command, 1994)

TABLE 3-3
NOISE ZONE DEFINITIONS

ICUZ Noise Zone	Subjective Personnel Assessment	Percentage of Population Highly Annoyed	A-Weighted dB (Note 1)	C-Weighted dB (Note 2)
I	Acceptable	<15	<65	<62
II	Normally Acceptable	15 - 39	65 - 75	62 - 70
III	Unacceptable	>39	>75	>70

Notes: 1. A-scale frequency weighted day-night average sound level (E.g., aircraft noise, small arms)
2. C-scale frequency weighted day-night average sound level (E.g., high energy impulsive sounds - large weapon fire, demolition)

The principal sources of noise on the Arsenal are rocket motor flight test and static firings, warhead detonations/impacts, gun firings, demolition, and airfield operations. Noise producing activities are located such that a significant buffer zone exists between noise producing activities and the nearest population centers. The largest population densities adjacent to the Arsenal are in Huntsville on the north and east boundaries. (U.S. Army Missile Command, 1994)

Current significant noise generating activities exist entirely within the southern portion of the ROI associated with the existing HDD Range. These activities result in Zone II and Zone III areas, neither of which extend to Buxton Road or off the Arsenal.

3.9 GEOLOGY AND SOILS

Affected Environment - The bedrock underlying the site of the Proposed Action is the Tuscumbia Limestone, which underlies most of RSA and has an average thickness of approximately 150 feet. The Tuscumbia Limestone consists of gray, medium to coarse-grained, fossiliferous limestone, and locally may contain chert nodules. The Fort Payne Chert, Chattanooga Shale, and other older geological units successively underlie the Tuscumbia Limestone. The Chattanooga Shale may form an impermeable, confining layer, regulating local ground-water flow.

A total of 94 soil phases representing 39 different soil series are mapped within the RSA boundaries (USDA, 1958). The predominant soil type mapped for the Arsenal consists of a deep, well-drained to moderately well-drained, silt loam to silty clay loam. These soils typically posses a loamy surface horizon underlain by a loamy to clayey subsoil layer with lenses of silty and/or sandy clay. Rock fragments generally occur throughout the clayey material.

Soil types found on the site of the Proposed Action north of Buxton Road are Pa, An, Ce, Op, and Al. South of Buxton they are Cb, Ex, Al, An, Me, and Wo. Tables 3.4a and 3.4b list the soil types by soil symbol and give their formal names which include a brief description of the soil type.

TABLE 3-4a
SOIL TYPES FOUND ON THE SITE NORTH OF BUXTON ROAD

Soil Symbol	Soil Name	Soil Color	Natural Drainage	Permeability
Al	Allen clay loam, severely eroded rolling phase	Reddish brown	Good	Moderately rapid
An	Allen fine sandy loam, eroded undulating phase	Reddish brown	Good	Moderately rapid
Ce	Colbert cherty silty clay loam, eroded undulating phase	Brownish yellow	Moderately good	Slow
Op	Ooltewah silt loam	Light yellowish brown	Somewhat poor	Moderate
Pa	Pearman Loam	Light yellowish brown	Moderately good	Slow

TABLE 3-4b
SOIL TYPES FOUND ON THE SITE SOUTH OF BUXTON ROAD

Soil Symbol	Soil Name	Soil Color	Natural Drainage	Permeability
Al	Allen clay loam, severely eroded rolling phase	Reddish brown	Good	Moderately rapid
An	Allen fine sandy loam, eroded undulating phase	Reddish brown	Good	Moderately rapid
Cb	Captina and Capshaw silt loams, level phases	Pale yellow	Moderately good	Moderately slow
Ex	Etowah silt loam, level phase	Brown to reddish brown	Good	Moderately rapid
Me	Melvin silty clay loam	Grayish brown to dark grayish brown	Poor	Slow
Wo	Wolftever silt loam	Grayish brown to brown	Moderately good	Moderately slow

Sources for Tables 3-4a & b: Extracted from Soil Survey of Madison County, USDA Soil Conservation Service. In cooperation with Alabama Department of Agriculture and Industries, Alabama Agricultural Experiment Station, and Tennessee Valley Authority. Series 1947, No. 3. Issued Feb. 1958.

There are numerous hydric soils found on RSA. Hydric soils are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation and therefore are common indicators of wetland areas on a site. Hydric soils found on the site of the Proposed Action are Op and Me, which both primarily occur south of Buxton Road where minimal construction activities would take place.

Several of the soil types found on the Proposed Action site may be considered easily eroded. These soils are Al, An, and Ce. No significant mineral resources are known to exist on the Arsenal (U.S. Army Missile Command, 1994).

3.10 SOCIOECONOMICS

Region of Influence - The ROI for socioeconomics is RSA, Huntsville, Madison County and northern Alabama. Socioeconomics within this EA is concerned with population and employment for this area.

Affected Environment - RSA contributes significantly to the economics and demographics of Madison County and northern Alabama. Madison County population, according to 1990 census data, is approximately 240,000. This figure includes over 160,000 that reside in Huntsville. The county labor force is over 140,000. RSA contributes over 21,000 Federal government and contractor jobs to the Madison County area, and is the single largest employer in the county. The Arsenal impacts the regional economy not only by direct employment of civilian and military personnel, but by procurement of goods and services as well. The salary and procurement dollars from RSA spent locally on goods and services creates a demand for additional employment and goods and services in the local and northern Alabama economies.

3.11 WATER RESOURCES

Affected Environment - The Tennessee River, flowing west, forms the southern boundary of the Arsenal. Major watercourses that flow through the Arsenal are Indian Creek, HSB, and McDonald Creek. Each of these tributaries flows generally south and empties into the Tennessee River. Most of the western half of RSA drains into Indian Creek, and the eastern half drains into HSB. Indian Creek originates in the northwestern portion of Madison County; flows southward across RSA; and forms an arm of Wheeler Lake. Indian Creek drains approximately 63 square miles of terrain. Approximately one-third of the Arsenal lies within the 100-year floodplain of the Tennessee River. These areas on the Arsenal include most of the WNWR, several creeks and ponds, and the Tennessee River banks.

The Fort Payne Chert and Tuscumbia Limestone are the principal aquifers in the ROI. Groundwater movement is generally from north to south. The groundwater in local aquifers moves to lowland areas in stream basins where it discharges through available openings and provides base flow to the local streams. The aquifers beneath RSA are some of the most productive in Madison County. (U.S. Army Missile Command, 1994)

The Arsenal has a facility wide National Pollutant Discharge Elimination System (NPDES) Permit.

4.0 ENVIRONMENTAL CONSEQUENCES

Federal environmental laws and regulations were reviewed to determine established thresholds for assessing environmental impacts (if any) under NEPA. Proposed activities were evaluated for their potential to result in significant environmental consequences based on the interpretation of significance outlined in the CEQ regulations for implementing the procedural provisions of NEPA (40 CFR 1500-1508) and AR 200-2, *Environmental Effects of Army Actions*.

CEQ Guidelines (40 CFR 1508.27) specify that significance should be determined in relationship to both context and intensity (severity). Three levels of impact can be identified:

- No Impact - No impact is predicted.
- No Significant Impact - An impact is predicted, but the impact does not meet the intensity/context significance criteria for the specific resource.
- Significant Impact - An impact is predicted that meets the intensity/context significance criteria for the specific resource.

Sections 4.1 through 4.11 describe expected impacts to the environment from the Proposed Action, impacts to the environment from alternatives, and potential mitigation measures. The amount of detail presented in each section is proportional to the potential for impacts.

4.1 AIR QUALITY

4.1.1 Proposed Action. The Proposed Action would generate insignificant amounts of criteria pollutants and hazardous air pollutants (HAPs). Such pollutants would be primarily from vehicle emissions used during training exercises. Intermittent construction-related impacts would result from fugitive dust and combustion emissions generated during construction activities of the proposed structures north of Buxton Road. A conservative estimate for uncontrolled fugitive dust (particulate matter) emissions from ground disturbing activities is 1.2 tons per acre per month of activity. Normally, half of these emissions are assumed to be PM10 (particulate matter with and aerodynamic diameter less than or equal to 10 microns). Combustion emissions would be generated during construction by the internal combustion engines of heavy construction vehicles and equipment. The main emission from heavy duty construction equipment are carbon monoxide, hydrocarbons, nitrogen oxides, aldehydes, sulfur oxides, and particulates. The EPA has tabulated estimates of the amounts of these pollutants emitted for various categories of heavy construction vehicles and equipment based on either the number of hours of operation or the amount of fuel consumed.

There would be no anticipated significant impacts to air quality from the proposed expansion and development of more realistic training scenarios for the HDTF at RSA.

4.1.2 No-Action. If the No-Action Alternative is chosen, there would be no impacts to air quality since no change would occur. Existing training activities at the HDS facilities would continue as scheduled.

4.1.3 Cumulative Impacts. No cumulative air quality impacts are anticipated for the Proposed Action in combination with other activities in the area.

4.1.4 Mitigation Measures. Construction-related emissions of fugitive dust and exhaust products would depend on the amount of construction and earthwork performed and the construction mobilization schedule. Fugitive dust from ground-disturbing activities would be reduced up to 50 percent by regular site-watering practices expected in standard construction practices. No mitigative measures would be necessary as a result of combustion emissions resulting from vehicle operations.

4.2 BIOLOGICAL RESOURCES

Criteria for determining the significance of potential impacts to biological resources are based on the relative importance of the resource, the quantity of the resource that would be impacted, the sensitivity of the resource to the proposed activities, and the duration of the impact. Impacts are considered significant if they are determined to have the potential to result in reduction of the population size of Federally or state listed threatened or endangered species, degradation of biologically important unique habitats, or substantial long-term loss of vegetation and the capacity of a habitat to support wildlife (i.e., negatively impact biodiversity).

Biological diversity (biodiversity), or the variety of life and its processes, is a basic property of nature that provides enormous ecological, economic, and aesthetic benefits. The loss of biodiversity is recognized as a major national, as well as global, concern with potentially profound ecological and economic consequences.

4.2.1 Proposed Action.

Vegetation

Land use in the areas currently under consideration for the HDTF has not changed appreciably in over 40 years. Past activities in these areas have cleared much of the native vegetation from around existing buildings in the area north of Buxton Road and the open fields and pine plantations of the exclusion zone of the existing HDD Range and the proposed new site north of this area. The existing structures in the area north of Buxton Road are surrounded by maintained, mowed lawns, which have been mowed infrequently in the past two years. There are some scattered trees around some of the existing structures in this area that would be impacted by the Proposed Action. The southern portion of the ROI north of Buxton Road is covered by a pine plantation. Pines in the southern-most section of this area are young (less than five years old), pines in the northern-most section of this area are older (greater than five years) and may be suitable for harvest. Harvest of these trees would be coordinated with the Installation Forester during final siting of the training scenarios proposed for this area. Trees greater than eight inches in diameter located near any of the existing structures considered for use by the HDS, or in areas under consideration for new construction, would be protected

during renovations and earth moving activities and such language would be included in the construction contracts issued for this project.

Proposed plans for a variety of training areas and scenarios in the area north of Buxton Road include paved roads between the different areas. If possible pre-existing old unpaved road beds, which have been cleared of trees, should be used, to the maximum extent possible for the paved roads connecting the new training sites. When compliance with these procedures are not possible, consultation should be made with the Installation Forester and Environmental Management and Planning personnel to minimize impacts to vegetation in these areas. In either case, the cutting of trees in the areas should be kept to a minimum.

Fish and Wildlife

There would be the potential for some short-term reduction in wildlife productivity associated with construction activities of the Proposed Action. However, species diversity is low in the area and the impacts would be of short duration. Vegetative cover would be re-established and the areas would rapidly recover wildlife values. Therefore, there would be no significant, long-term impacts to wildlife resources. In fact, the wildlife values of many areas would be improved by the establishment of vegetative corridors to link the forested areas around the site.

Aquatic Habitats

No significant aquatic habitats were identified in the areas north of Buxton Road. Implementing the Proposed Action would have no measurable direct or indirect impacts on fishery resources in this area of the ROI. No impacts to the two small first-order streams located in the ROI south of Buxton Road would be anticipated. These streams and the surrounding wetland areas would be avoided since they are not suitable for conducting the activities associated with the Proposed Action.

Threatened and Endangered Species

No Federally listed or candidate species have been directly documented from the areas considered in the Proposed Action. Habitat bounding the eastern and western edge of the current HDD Range is suitable for the Federally listed as endangered gray bat and the threatened bald eagle, both of which use the Installation for feeding and resting. However, as similar activities to the Proposed Action currently occur in this region, no additional impacts to threatened or endangered species would be anticipated.

Unique Habitats

The ALNHP has performed extensive surveys for unique habitats and species on RSA (ALNHP, 1995) and has identified several unique habitats. None are close to the areas north and south of Buxton Road considered in the Proposed Action. Based on this information it is concluded that the Proposed Action would not impact unique habitat resources at RSA.

4.2.2 No Action. There would be no impacts to biological resources under the No-Action Alternative.

4.2.3 Cumulative Impacts. No other activities have been identified that, together with the Proposed Action, would have the potential for cumulative impacts on biological resources.

4.2.4 Mitigation Measures. Short term impacts to surrounding vegetation resources during construction activities are expected to be not significant and can be mitigated by the implementation of construction best management practices. Contracts would be worded such that trees greater than eight inches in diameter would be protected during construction activities. Cutting of any trees greater than eight inches in diameter would be coordinated with the Installation Forester and Directorate of Environmental management and Planning personnel. The areas would be revegetated with grasses as soon after construction as practicable to prevent erosion.

4.3 CULTURAL RESOURCES

4.3.1 Proposed Action.

Phase I Archaeological Survey

Impacts to the twelve archaeological sites discussed in Section 3.3, would not be anticipated assuming they are adequately identified, flagged, and access restricted during construction activities. After the NRHP eligibility has been established, access to sites not eligible for listing would no longer be restricted. Determination for access to sites eligible for listing would be at the discretion of the Installation Cultural Resources Manager. These sites are currently undergoing eligibility determination at the ALSHPO. It is the opinion of the proponent of this action that no structures located within the entire ROI meet the eligibility criteria for listing in the NRHP.

Determination of Eligibility Survey

Under National Register criterion B, a property must retain integrity from its period of significant historic associations (National Register Bulletin 32, 1989). If Colonel Hudson did possess significance under criterion B, Building 7123 would need to retain its integrity from his occupancy during World War II. Completed in 1942, this dwelling was enlarged to its present appearance in 1956. The original front porch was enclosed to expand the original living room and an additional 1,000 square feet of floor space was added. This addition almost doubled the size of the original dwelling and included a rear bedroom, a new living room with a terrazzo tile fireplace mantel, and garage. The entrance into the dwelling was rebuilt and the floor plan altered with an enlarged kitchen area. At the rear facade a one-story porch with wood columns was added along with a brick barbecue pit. This remodeling included the addition of a large picture window on the main facade. Due to its 1956 remodeling, Building 7123 no longer retains its appearance from Hudson's occupancy from World War II.

The Administrative Area under consideration at RSA no longer retains its overall appearance from its World War II era. The majority of dwellings were altered in the

years following the war and during the mid-1950s. The appearance of this area is one reflective more of the Cold War rather than its original design, plan, and layout of World War II.

In accordance with Section 106 of the National Historic Preservation Act, no construction or training that would disturb or alter the existing facilities will begin within the housing area (7100 Area) until ALSHPO has concurred with the non-eligibility of these buildings or any adverse effects have been mitigated with a Memorandum of Agreement (MOA) among RSA, ALSHPO, and the Advisory Council.

Significance of Redstone Arsenal's First Commander, Colonel Carroll D. Hudson

Colonel Hudson was one of many Army Ordnance officers who served with distinction during World War II. He proved to be an efficient administrator and RSA was a major contributor to Army ordnance during the war years. However, Hudson's contributions to the war effort do not appear to be above and beyond those of hundreds of other officers who operated ordnance plants, naval yards, airfields, and other installations integral to the war effort. None of the biographical information on Colonel Hudson suggests that he developed innovative techniques in chemical production which were adopted by the Army. He also does not appear to have played a role in any major changes to ordnance plant planning or production line design. Although an able and highly respected officer in Army Ordnance, there is no evidence that he was of sufficient significance to meet National Register criterion B for his role in military history.

4.3.2 No-Action. There would be no negative impacts to cultural resources under the No-Action Alternative. Activities currently ongoing within the ROI would be reviewed on the basis of the findings of the attached Determination of Eligibility report and the Phase I Archaeological Survey and the potential for impacts assessed. The Installation Cultural Resources Manager would establish guidance to ensure that these potential cultural resources were not impacted.

4.3.3 Cumulative Impacts. There are no anticipated cumulative impacts to Cultural Resources due the Proposed Action.

4.3.4 Mitigation Measures.

Phase I Archaeological Survey

As a result of the Phase I Archaeological Survey, it is recommended that the Proposed Action cordon off and avoid the following sites:

- Site 1Ma657
- Site 1Ma761
- Site 1Ma763
- Site 1Ma767
- Site 1Ma768
- Site 1Ma769
- Site 1Ma771

If this option is not feasible, additional archaeological testing must be performed to recover a sample of the cultural materials present and define the site's potential NRHP significance prior to potential site disturbing activities. If Phase II archaeological testing is to be done, Phase II proposals must be developed and submitted to the Alabama Historical Commission for review and approval prior to commencement of Phase II work.

No Phase I archaeological survey, despite an intense effort and excellent research sampling strategy, precludes the possibility that an important archaeological site may be discovered during the subsequent construction or clearing activities. Federal cultural resource preservation statutes mandate that should such materials become apparent during construction or clearing, such materials must be identified and evaluated for eligibility for inclusion in the National Register by a qualified archaeologist. Should human remains be encountered during the construction or clearing, Federal and Alabama cultural resource preservation statutes specify that work must cease and the RSA Cultural Resources Manager be notified immediately by telephone followed by written confirmation of the inadvertent discovery.

If government or contractor personnel observe items that might have historical or archaeological significance during construction activities, they would be required to report their observations immediately to RSA's Cultural Resources Manager to determine their significance and any special disposition of the finds. Activities in the area of the discovery that may result in the destruction of these resources would cease and personnel would be prevented from trespassing on, removing, or otherwise damaging such resources. Language to protect these resources would be included in the construction contract.

4.4 HAZARDOUS MATERIALS AND WASTE

4.4.1 Proposed Action. No impacts would be expected from the proposed construction or renovation of structures north or south of Buxton Road. These activities would not be anticipated to generate hazardous materials and waste.

If ACM or LBP are confirmed to be present, the proponent would be required to comply with the management procedures outlined in the Installation's Asbestos Management and LBP Management Plans.

4.4.2 No-Action. There would be no impacts to hazardous materials and waste as the current activities do not utilize significant quantities of hazardous materials nor generate hazardous wastes.

4.4.3 Cumulative Impacts. No other activities have been identified that, together with the Proposed Action, would have the potential for cumulative impacts on hazardous materials and waste.

4.4.4 Mitigation Measures. No mitigative measures would be necessary.

4.5 HEALTH AND SAFETY

4.5.1 Proposed Action. Health and safety impacts could occur due to construction of the structures in the areas identified in the Proposed Action. Potential impacts to health and safety from these activities would be minimized by using established safety procedures. These include AR 385-10, *Safety*, and all appropriate OSHA regulations including 29 CFR Part 1926, *Safety and Health Regulations for Construction*, that would be followed during the course of all construction activities. All applicable Federal, state, and local laws and regulations would be followed during construction.
New HDS facilities would not used for the destruction of ammunition or explosive ordnance disposal (EOD). Live ordnance demolition would continue to be performed only for training and not for disposal purposes. Range activities would continue to be used to conduct training using Army-specific EOD tools and equipment. Activities such as these are considered to be routine and have been conducted at the Arsenal for many years. The areas where potentially hazardous activities would occur would be fenced with six foot high chain-link fencing and access would be controlled. Therefore, impacts from the Proposed Action would be considered not significant.

4.5.2 No-Action. There would be no additional impacts to health and safety from not implementing the Proposed Action. Existing training activities at the HDS facilities would continue as scheduled.

4.5.3 Cumulative Impacts. No other activities have been identified that, together with the Proposed Action, would have the potential for cumulative impacts on health and safety.

4.5.4 Mitigation Measures. Mitigation measures for normal operations at the HDS facilities and ranges that are currently in effect and should be maintained include:

- storage of hazardous materials with flashpoints less than 141° F inside flammable safety cabinets,
- training of all personnel per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200),
- the participation of personnel involved in calibration and repair of meters involving radioactive sources in a three week Radiation Protection course,
- minimizing the inhalation potential from explosive materials by conducting all demolition activities outdoors,
- instructing personnel to avoid touching sensitive areas of the body when working with explosives and to wash their hands after working with explosives (especially before consuming food),
- using lead vests when working around X-ray machines,
- continuing to have the Arsenal Fire Department stand by during demolition activities conducted during dry weather, and
- having Material Safety Data Sheets (MSDSs) and chemical inventories available at all locations.

4.6 INFRASTRUCTURE AND TRANSPORTATION

4.6.1 Proposed Action. There are no significant impacts anticipated to infrastructure and transportation under the Proposed Action. There would be new utility and road

requirements expected for proposed construction activities north of Buxton Road. New road requirements would be for paved roads to connect the various training and scenario areas. Use of these roads would be restricted to instructors, students, and staff of the HDS and would not be connected to major use roadways of the Arsenal. These road and utility requirements would not be expected to exceed capabilities to handle increases. No new utility or road requirements are expected for proposed construction activities south of Buxton. There would also be an increase in vehicular traffic associated with the Proposed Action. The Arsenal's roadway network is adequate to handle this expected increase.

4.6.2 No-Action. There would be no impacts to infrastructure and transportation from not implementing the Proposed Action. Existing training activities at the HDS facilities would continue as scheduled.

4.6.3 Cumulative Impacts. Since no infrastructure and transportation impacts have been identified for the Proposed Action, the potential for incremental, cumulative impacts does not exist.

4.6.4 Mitigation Measures. No mitigation measures are necessary for Infrastructure and Transportation.

4.7 LAND USE

4.7.1 Proposed Action. There would be no impacts to land use from implementation of the Proposed Action. The Proposed Action is consistent with current RSA land use plans (MICOM, 1989).

4.7.2 No Action. There would be no impacts to land use since no change would occur. Existing training activities at the HDS facilities would continue as scheduled.

4.7.3 Cumulative Impacts. Since no land use impacts have been identified for the Proposed Action, the potential for incremental, cumulative impacts does not exist.

4.7.4 Mitigation Measures. No mitigation measures are necessary.

4.8 NOISE

4.8.1 Proposed Action. There would be no significant impacts anticipated from noise due to the Proposed Action. Proposed training operations of the HDS would be conducted in an environmentally conscientious manner, so as to minimize the potential for noise impacts. There are no sensitive noise receptors (e.g., endangered species, hospitals, schools) located near the proposed ROI. Activities would not result in the encroachment of ICUZ Zone II or Zone III noise levels outside Arsenal boundaries. Normal earth-moving equipment operations would generate noise only during construction activities, and would be of limited duration. However, the limited duration of the construction activities in these locations and the normal ambient noise that occurs in this area would cause no significant additional noise impacts. The noise produced from these activities are anticipated to be similar to that of normal construction noise levels as presented in Table 4-1.

TABLE 4-1
TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	Noise Level (dBA @ 50 feet)
Bulldozer	80
Front end loader	72-84
Dump truck	83-94
Jack hammer	81-98
Crane with ball	75-87
Backhoe	72-93
Scraper	80-93
Grader	80-93
Roller	73-95
Paver	86-88

Source: U.S. Air Force, 1996

The HDS training activities that produce noise are considered to be consistent with Arsenal operations. The noise producing activities are not continuous and occur only for very short periods of time. Training operations are conducted in controlled areas with no significant noise increase expected over current operations. Entry to the training areas is limited to only essential personnel (instructors and students).

4.8.2 No Action. There would be no anticipated impacts from noise under this alternative, since no additional activities would occur.

4.8.3 Cumulative Impacts. No other activities have been identified that, together with the Proposed Action, would have the potential for cumulative noise impacts. The noise producing activities are not continuous and only occur for short periods of time. At no time do training operations personnel conduct simultaneous exercises that result in significant noise impacts. Noise impacts would not be anticipated in accumulation with other noise producing activities to result in impacts outside the Arsenal boundaries.

4.8.4 Mitigation Measures. Trained personnel (instructors and students) would follow all applicable in-place regulations for hearing protection and noise attenuation. The Arsenal would take measures to reduce noise such as monitoring weather to avoid the use of ranges when conditions (i.e., temperature, humidity, wind, and cloud cover) are not favorable. Unacceptable noise production would be stopped until conditions are proper to avoid any complaints.

4.9 GEOLOGY AND SOILS

4.9.1 Proposed Action. There would be no significant impacts anticipated to geology or soils from the Proposed Action. Best management practices for erosion control, topsoil management and revegetation would be required and stated in the construction contract.

4.9.2 No Action. There would be no impacts to geology and soils from not implementing the Proposed Action. Existing training activities at the HDS facilities would continue.

4.9.3 Cumulative Impacts. No other activities have been identified that, together with the Proposed Action, would have the potential for cumulative impacts on geology and soils.

4.9.4 Mitigation Measures. Erosion control measures including topsoil management and revegetation of areas that are disturbed would be required. Siltation barriers would also be required to minimize sediment runoff to surrounding areas during construction activities.

4.10 SOCIOECONOMICS

4.10.1 Proposed Action. The Proposed Action would have a positive, though not significant, impact on local socioeconomics from implementing the Proposed Action. Incidental positive impacts to socioeconomics associated with future construction projects would be expected. An increase in student levels would result in minor positive impacts to the local economy from lodging, meals, and incidental expenditures. Increases in instructor staffing would be anticipated to come from local resources, primarily, and therefore are not expected to result in significant economic impacts.

4.10.2 No-Action. There would no socioeconomic impacts anticipated if the activities remain unchanged.

4.10.3 Cumulative Impacts. There would be potential positive cumulative impacts anticipated to local socioeconomics, similar to those mentioned in Section 4.10.1

4.10.4 Mitigation Measures. No mitigation measures are anticipated.

4.11 WATER RESOURCES

4.11.1 Proposed Action. There would be potential for impacts, though not significant, to water resources due to construction of facilities and infrastructure under the Proposed Action. Soils disturbed during these activities could possibly be washed into drainage ditches and, potentially, into RSA watercourses. Erosion control during these activities would be undertaken with the use of hay bales and silt fencing to prevent the movement of soils via surface waters. These procedures would be required in the construction contract. The selected building contractor would obtain a NPDES construction permit from the Alabama Department of Environmental Management. The selected building contractor would comply with the NPDES permit requirements

4.11.2 No Action. If the No-Action Alternative were chosen, no construction would take place and the existing facilities would remain as they are at present. The current facilities would remain in place and threats to water resources would not occur.

4.11.3 Cumulative Impacts. As a result of Installation construction contractors implementing best management practices, the Proposed Action would not be expected to result in cumulative impacts to Water Resources.

4.11.4 Mitigation Measures. Under the Proposed Action Alternative, erosion control methods must be used to prevent surface erosion sediments from entering any of the drainage ditches near any of the buildings. Siltation barriers placed prior to construction activities would be required to minimize any such runoff. These procedures would be required in the construction contract.

4.12 INDIVIDUALS/ORGANIZATIONS RESPONSIBLE FOR OBTAINING REQUIRED PERMITS/LICENSES/ENTITLEMENTS

There are no permits/licenses/entitlements required to continue HDS training activities. The building contractor(s) selected to construct the new buildings on HDS-controlled land would obtain a NPDES construction permit from the Alabama Department of Environmental Management (ADEM). The contractor would comply with the requirements of this NPDES permit as well as all applicable Federal, state, and local laws and regulations during construction activities.

4.13 CONFLICTS WITH FEDERAL. STATE, OR LOCAL LAND USE PLANS, POLICIES, AND CONTROLS

The Proposed Action would have no impact on existing land use and presents no conflicts with Federal, regional, state, or local land use plans, policies, or controls.

4.14 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL

Anticipated energy requirements of program activities can be accommodated within the energy supply of the region. Energy use would follow established energy conservation practices.

4.15 NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND CONSERVATION POTENTIAL

Other than the use of vehicle fuels for training and construction activities, no significant use of natural or depletable resources is required by the Proposed Action.

4.16 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

Although the Proposed Action would result in some irreversible and irretrievable commitment of resources such as fuel and labor, this commitment of resources is not significantly different from that necessary for regular activities taking place during HDS training activities or on the Arsenal in general.

4.17 ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

Adverse environmental effects that cannot be avoided include construction-related emissions of fugitive dust and exhaust products; temporary displacement of wildlife during construction due to noise and construction activities; some destruction of existing vegetation; and some sediment runoff into surrounding areas during construction activities. However, through implementation of the program actions and mitigation measures described within this document, these effects can be minimized.

4.18 BIOLOGICAL DIVERSITY.

Biological diversity (biodiversity), or the variety of life and its processes, is a basic property of nature that provides enormous ecological, economic, and aesthetic benefits. The loss of biodiversity is recognized as a major national as well as global concern with potentially profound ecological and economic consequences. The "*Ecosystem Management Policy Directive*" issued in 1994 by DoD's Deputy Under Secretary of Defense, articulates the biodiversity conservation policy embraced by the DoD and the military departments. The goal of this policy is to:

"*Maintain and improve the sustainability and native biodiversity of terrestrial and aquatic, including marine, ecosystems while supporting human needs, including the DoD mission*."

Conservation of biodiversity is a national goal provided for in the framework of NEPA. This goal is to anticipate and evaluate the effects of federal actions on biodiversity and actively manage for the reduction of the impact of these effects as well as the promotion of restoration to previously impacted areas. The DoD Environmental Conservation Instruction, signed in 1996, lays out specific management tactics to achieve conservation goals:

- "*Maintain or restore remaining native ecosystem types across their natural range of variation*."
- "*Maintain or reestablish viable populations of all native species in areas of natural habitat, when practicable*."
- "*Maintain evolutionary and ecological processes, such as disturbance regimes, hydrological processes, and nutrient cycles*."
- "*Manage over sufficiently longtime periods to allow for changing system dynamics*."
- "*Plan to accommodate human use as necessary*."

The basic goal of biodiversity conservation is to maintain naturally occurring ecosystems, communities, and native species. For the Proposed Action evaluated in this EA, impacts to the biodiversity of the ROI would be significant if the mitigative measures outlined are not implemented. The area has been previously disturbed and

the ecosystem altered for several decades and measures should be taken to restore and protect the biodiversity of the area.
Suggestions to minimize any anticipated impacts for planned or previous construction in the ROI, and subsequently increase biodiversity in this area, include:

- Incorporate measures to minimize landscape fragmentation.
- Link blocks of originally connected habitat through landscape corridors.
- Utilize only native species in landscape plantings.
- Monitor for biodiversity impacts and for changes in biodiversity.
- Restrict training to already disturbed areas (fields checked for cultural resources) to minimize impacts to biodiversity.

4.19 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE HUMAN ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The Proposed Action would use existing facilities and infrastructure on Redstone Arsenal and would not eliminate any options for future use. The Proposed Action would be undertaken in accordance with the *Redstone Arsenal Master Plan EA* (U.S. Army Missile Command 1994) that provides a management tool to aid in making operational support decisions by incorporating the concept of comprehensive planning.

4.20 FEDERAL ACTIONS TO ADDRESS ENVIRONMENTAL JUSTICE IN MINORITY POPULATIONS AND LOW-INCOME POPULATIONS

The Proposed Action would not substantially affect human health or the environment and would not exclude persons from participation, deny persons the benefits, or subject persons to discrimination because of their race, color, or national origin.

4.21 CONDITIONS NORMALLY REQUIRING AN ENVIRONMENTAL IMPACT STATEMENT

The potential impacts arising from the continued HDS training activities were evaluated specifically in the context of the criteria for actions requiring an Environmental Impact Statement described in DoD Directive 6050.1, *Environmental Effects in the United States of Department of Defense Actions* (U.S. Department of Defense 1979), and AR 200-2, *Environmental Effects of Army Actions* (U.S. Department of the Army 1988).

Specifically, the proposed project activities were evaluated for their potential to:

- significantly affect environmental quality or public health and safety;
- significantly affect historic or archaeological resources, public parks and recreation areas, wildlife refuge or wilderness areas, wild and scenic rivers, or aquifers;
- adversely affect properties listed or meeting the criteria for listing on the National Register or the National Registry of National Landmarks;
- significantly affect prime and unique farmlands, wetlands, ecologically or culturally important areas, or other areas of unique or critical environmental concern;

- result in significant and uncertain environmental effects or unique or unknown environmental risks;
- significantly affect a species or habitat listed or proposed for listing on the Federal list of endangered or threatened species;
- establish a precedent for future actions;
- adversely interact with other actions resulting in cumulative environmental effects; and
- involve the use, transportation, storage, and disposal of hazardous or toxic materials that may have significant environmental impact.

The evaluation indicated that the Proposed Action for continued, modernized, and expanded HDS training operations and construction activities did not meet any of these criteria.

5.0 CONCLUSIONS

RSA proposes to expand and develop more realistic training facilities and increase the capacity of the HDS in an environmentally conscious, consistent and effective manner. The purpose of this EA was to examine the potential environmental impacts that would reasonably be anticipated if the Proposed Action were undertaken. This document would also assist in tiering future environmental documents, such as EAs and Records of Environmental Consideration (RECs), if required.

No significant impacts to any of the resources examined in this EA are anticipated from implementing the Proposed Action or the No Action Alternative. A short-term positive impact to socioeconomics would be anticipated from construction activities and increased student enrollment expected from implementing the Proposed Action Alternative.

Under the No-Action Alternative, RSA would not construct new facilities for the HDS. If this alternative is chosen the capabilities of the HDS to sustain an increased student enrollment would be adversely impacted due to class crowding and inadequate facilities. Additionally, the ability of the HDS to provide realistic, state-of-the-art training scenarios would remain limited without the construction of new facilities. The No-Action Alternative was not chosen primarily for these reasons.

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7.0 INDIVIDUALS/AGENCIES CONSULTED

7.1 AGENCIES/ORGANIZATIONS SENT COPIES OF THE ASSESSMENT

As part of the CEQ Regulations on the National Environmental Policy Act, the U.S. Army Aviation and Missile Command is circulating the Environmental Assessment for the Development of a Hazardous Devices Training Facility on Redstone Arsenal, Alabama, to the following agencies, organizations, and individuals:

Alabama State Historic Preservation Office, Montgomery, Alabama

U. S. Fish and Wildlife Service, Daphne, Alabama

U. S. Environmental Protection Agency, Atlanta, Georgia

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